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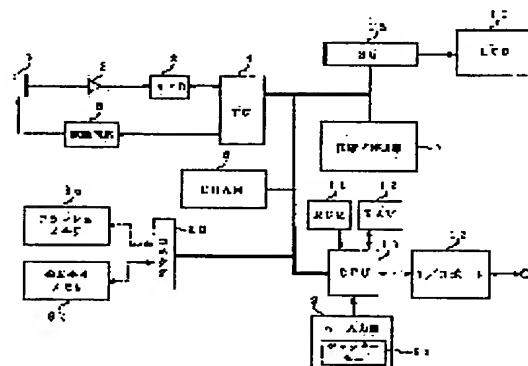
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(54) ELECTRONIC IMAGE PICKUP DEIVCE, ELECTRONIC CAMERA SYSTEM AND RECORDING MEDIUM

(57)Abstract:

**PROBLEM TO BE SOLVED:** To store the image data of photographed images in a latter storage means as they are by storing the photographed images as image data in either an image data reloadable storage means or an image data unrelodable storage means.

**SOLUTION:** A CCD 1 converts a still picture to an electric signal, that signal is converted to amplified and converted to digital data by a buffer 2 and an A/D converting part 3, after-wards, according to a generated timing signal, a timing generator(TG) 4 fetches image data and temporally stress them in a DRAM (dynamic memory) 6. Then, a compression/expansion part 7 compresses a luminance signal and a chrominance signal separated by color arithmetic processing and the compressed image data (luminance signal and chrominance signal) are stored in a storage/erasure enabled flash memory 8a or in an erasure disabled memory 8b with which image data can be stored but erasure is inhibited by a software or the like. These memories 8a and 8b can be attached/detached through a connector 20.



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## CLAIMS

[Claim(s)]

[Claim 1]An electronic imaging device comprising:

A photographing device which photos an image.

The 1st memory measure that memorizes image data so that rewriting is possible.

The 2nd memory measure that rewrites image data and is memorized improper.

A storage control means memorized to either one of said 1st memory measure or said 2nd memory measure by making into image data an image photoed by said photographing device.

[Claim 2]The electronic imaging device according to claim 1, wherein it is removable in said 1st and 2nd memory measures and is equipped with either at once.

[Claim 3]Provide a selecting means which chooses as which of said 1st memory measure or said 2nd memory measure whether image data is memorized, and said storage control means, The electronic imaging device according to claim 1 memorizing an image photoed by said photographing device to a memory measure with said selected selecting means as image data.

[Claim 4]An imaging means which picturizes a picture of a photographic subject.

A directing means which directs image taking by said imaging means.

A memory measure which memorizes a picture corresponding to a picture which answered operation of said directing means and was picturized by said imaging means.

A storage control means which controls writing and read-out of said memory measure.

A reproduction means which reproduces a picture memorized by a picture picturized by said imaging means or said memory measure.

Are the electronic imaging device provided with the above, answer operation of said directing means, provide a control means which adds identification information which shows that it is unchangeable in said picture, and said storage control means, When said identification information is added to an already memorized picture at the time of writing control to said memory measure, a picture to which said identification information was added is made unchangeable by not performing writing processing again to the picture.

[Claim 5]The electronic imaging device comprising according to claim 4:

An encoding means as which said control means enciphers said picture with said identification information.

A decoding means which decodes enciphered data.

[Claim 6]The electronic imaging device comprising according to claim 4:

An embedding means by which said control means embeds predetermined information in said picture.

Separating mechanism which separates said predetermined information from a picture where said predetermined information is embedded.

[Claim 7]The electronic imaging device according to claim 4 provided with a warning means which displays warning information which warns of the ability not to be changed when said control means is reproducing a picture picturized by said reproduction means from said imaging means.

[Claim 8]Said directing means has two steps of distance, and said warning means is operated to said control means in the 1st distance, The electronic imaging device according to claim 7 making control which writes a picture corresponding to a picture picturized by said storage control means by said imaging means in the 2nd distance in said memory measure perform.

[Claim 9]The electronic imaging device according to claim 4, wherein said memory measure comprises a main part of an electronic imaging device removable.

[Claim 10]The electronic imaging device according to claim 4 provided with a means of communication which transmits and receives data memorized by said memory measure.

[Claim 11]The electronic imaging device according to claim 4, wherein it has a connecting means linked to information machines and equipment and said directing means operates with a signal from information machines and equipment connected by said connecting means.

[Claim 12]The electronic imaging device according to claim 4 having [ whether said control means makes changeable a picture which answers operation of said directing means and said memory measure is made to memorize or change being made improper, and ] a selecting means to choose.

[Claim 13]The electronic imaging device according to claim 4, wherein it has an editing means which edits a picture memorized to said memory measure and said reproduction means does not reproduce a picture to which

said identification information was added at the time of edit by said editing means.

[Claim 14] It is an electronic camera system which consists of an electronic camera and a means of communication which were connected via a communication line, and information machines and equipment, Transmission of a picture picturized with said electronic camera is enabled via said communication line, An electronic camera system when said electronic camera is set [ a picture which has a means to set up said picture improper / change / and to transmit, and was received via a communication line ] up improper [ change ], wherein it cannot change this picture by a side which received.

[Claim 15] Even if it decodes a picture which is enciphered with identification information which shows that a picture set up improper [ said change ] is unchangeable, and was this enciphered by a receiver, The electronic camera system according to claim 14 characterized by this picture being unchangeable when identification information which shows that it is unchangeable is added.

[Claim 16] A storage comprising:

A program code which is a storage which is read by computer and memorizes a executable program code, and makes a picture of a photographic subject picturize.

A program code to which shutter operation is made to perform.

A program code which answers this shutter operation and makes a memory measure memorize a picture corresponding to said picturized picture.

A program code which controls writing and read-out of said memory measure, A program code which reproduces a picture memorized by said picturized picture or said memory measure, A program code which adds identification information which shows that said shutter operation cannot be answered and it cannot change in said picture, A program code which makes unchangeable a picture memorized by said memory measure that it should control not to perform writing processing when said identification information is detected and said identification information is added to said picture at the time of writing control to said memory measure.

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[Translation done.]

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#### DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the storage which memorized the program code which performs image pick-up of the electronic imaging device which picturizes and memorizes a picture, the electronic camera system which transmits the picturized picture, and a picture, memory, and reproduction control.

[0002]

[Description of the Prior Art] Conventionally, the optical still picture etc. which were caught with the lens are changed into an electrical signal as an electronic imaging device with image sensors, such as CCD (Charge Coupled Device; charge coupled device) and MOS, The electronic "still" camera memorized to semiconductor memory and recording media, such as a floppy disk, is known. In this electronic "still" camera, since the still picture etc. are recorded as electric information, It has the feature that it can reproduce with a television set then, can transmit to a remote place using a communication line, or can transmit to other apparatus (for example, other electronic "still" cameras, computers, etc.) using infrared rays, or various image processing can be performed.

[0003]

[Problem(s) to be Solved by the Invention]By the way, in the conventional electronic "still" camera mentioned above, the point that the photoed image data can usually be rewritten freely has been the feature. That is, with the camera using a film, it is possible to eliminate the photoed impossible image data or to overwrite image data new on image data by holding the photoed image as image data which is digital data. Thus, photography number of sheets is securable by writing in the newly photoed image data on unnecessary image data or the image data in which photography failed.

[0004]However, also in use of the above-mentioned electronic "still" camera, image data may be modified, or it is not what was rephotoed repeatedly and the photoed image as it is may be needed like the camera using a film. However, since image data was fundamentally memorized so that rewriting was possible, there was a problem that it could not be confirmed whether it is the image as it is photoed or it could not memorize the photoed image as it is.

[0005]Then, an object of this invention is to provide the electronic imaging device, electronic camera system, and storage which can memorize the photoed image as it is as image data.

[0006]

[Means for Solving the Problem]Invention this invention according to claim 1 is characterized by an electronic imaging device comprising the following for the above-mentioned purpose achievement.

A photographing device which photos an image.

The 1st memory measure that memorizes image data so that rewriting is possible.

The 2nd memory measure that rewrites image data and is memorized improper.

A storage control means memorized to either one of said 1st memory measure or said 2nd memory measure by making into image data an image photoed by said photographing device.

[0007]It is removable like a statement to claim 2 in said 1st memory measure and the 2nd memory measure, for example, and may be made to be equipped with either at once preferably.

[0008]A selecting means chosen [ according to claim 3 ] for to which image data shall be memorized between said 1st memory measure or said 2nd memory measure like, for example is provided preferably, It may be made for said storage control means to memorize an image photoed by said photographing device to a memory measure with said selected selecting means as image data.

[0009]In order to attain the above-mentioned purpose, in an electronic imaging device by claim 4 statement. An imaging means which picturizes a picture of a photographic subject, and a directing means which directs image taking by said imaging means, A memory measure which memorizes a picture corresponding to a picture which answered operation of said directing means and was picturized by said imaging means, In an electronic imaging device possessing a storage control means which controls writing and read-out of said memory measure, and a reproduction means which reproduces a picture memorized by a picture picturized by said imaging means or said memory measure, Answer operation of said directing means, provide a control means which adds identification information which shows that it is unchangeable in said picture, and said storage control means, When said identification information is added to an already memorized picture at the time of writing control to said memory measure, a picture to which said identification information was added is made unchangeable by not performing writing processing again to the picture.

[0010]Said control means may be preferably provided with the encoding means according to claim 5 which enciphers said picture with said identification information, and a decoding means which decodes enciphered data like, for example.

[0011]Said control means may be preferably provided with separating mechanism which separates said predetermined information, for example from the embedding means according to claim 6 which embeds predetermined information in said picture like, and a picture where said predetermined information is embedded.

[0012]Preferably, when said control means is reproducing the picture according to claim 7 picturized by said reproduction means from said imaging means like, for example, it may be provided with a warning means which displays warning information which warns of it being unchangeable.

[0013]Preferably said directing means, for example like a statement to claim 8, It may be made to make control which writes a picture corresponding to a picture which has two steps of distance, operated said warning means to said control means in the 1st distance, and was picturized by said storage control means by said imaging means in the 2nd distance in said memory measure perform.

[0014]Said memory measure may comprise a main part of an electronic imaging device removable, for example

like a statement to claim 9 preferably.

[0015]It may be made to have preferably a means of communication for which the data according to claim 10 further memorized by said memory measure like is transmitted and received, for example.

[0016]It has the connecting means according to claim 11 further connected with information machines and equipment like, for example, and may be made for said directing means to operate preferably with a signal from information machines and equipment connected by said connecting means.

[0017]It may have whether said control means makes it is desirable and possible, for example change of the picture according to claim 12 which answers operation of said directing means and said memory measure is made to memorize like or change is made improper, and a selecting means to choose. It has preferably an editing means for which the picture according to claim 13 further memorized to said memory measure like is edited, for example, and said reproduction means may not be made not to reproduce a picture to which said identification information was added at the time of edit by said editing means.

[0018]In order to attain the above-mentioned purpose, in an electronic camera system by claim 14 statement. It is an electronic camera system which consists of an electronic camera and a means of communication which were connected via a communication line, and information machines and equipment, Transmission of a picture picturized with said electronic camera is enabled via said communication line, said electronic camera has a means to set up said picture improper [ change ], and to transmit, and when a picture received via a communication line is set up improper [ change ], this picture cannot be changed by a side which received. A picture set up improper [ said change ] preferably, For example, it is enciphered with identification information which shows the thing [ that it is / like / unchangeable ] according to claim 15, and even if it decodes a picture this enciphered by a receiver, when identification information which shows that it is unchangeable is added, it may prevent from changing this picture.

[0019]In order to attain the above-mentioned purpose, in a storage by claim 16 statement. A program code which is a storage which is read by computer and memorizes a executable program code, and makes a picture of a photographic subject picturize, A program code to which shutter operation is made to perform, and this shutter operation are answered, A program code which makes a memory measure memorize a picture corresponding to said picturized picture, A program code which controls writing and read-out of said memory measure, A program code which reproduces a picture memorized by said picturized picture or said memory measure, A program code which adds identification information which shows that said shutter operation cannot be answered and it cannot change in said picture, When said identification information was detected and said identification information was added to said picture at the time of writing control to said memory measure, a program code which makes unchangeable a picture memorized by said memory measure that it should control not to perform writing processing was provided.

[0020]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described with reference to drawings as a mode of the 1 operation applied to the electronic "still" camera.

A. The lineblock diagram 1 of the composition A-1. electronic "still" camera of the mode of the 1st operation is a block diagram showing the composition of the electronic "still" camera in the mode of operation of the 1st of this invention. In a figure, 1 is CCD (or MOS), changes into an electrical signal the still image which carried out image formation via the lens which is not illustrated, and supplies it to the buffer 2. After the buffer 2 amplifies the above-mentioned still image signal to a predetermined level, it is supplied to the A/D conversion part 3. After the A/D conversion part 3 changes the above-mentioned still image signal into digital data (henceforth image data), it is supplied to TG(Timing Generater; timing generator) 4. According to this timing signal, TG4 incorporates described image data and it outputs it to a data bus while it generates the timing signal for controlling the drive circuit 4 which drives CCD1 and supplies this to the drive circuit 5.

[0021]Next, 6 is DRAM (dynamic memory) and is a storage which stores temporarily the image data which the above-mentioned TG4 outputs. This image data is read when photography for one screen is completed, and color data processing which separates a luminance signal and a chrominance signal is performed. The above-mentioned luminance signal and chrominance signal from which 7 was separated by color data processing, For example, while compressing with compression technology, such as a JPEG (Joint Photographic Coding Experts Group) method, they are the compression/extension part which performs processing which elongates the compressed image data. 8a and 8b store two or more image data (a luminance signal and a chrominance signal) compressed [ above-mentioned ], It is a memory removable to the device concerned via the connector 20, and 8a is a flash memory in which memory/elimination (overwrite) is possible, and although 8b can memorize image

data, it is the elimination improper memory to which elimination (overwrite) was forbidden by software or hardware.

[0022]In the mode of the 1st operation, either the above-mentioned flash memory 8a or the elimination improper memory 8b is used for the connector 20, fitting in. When it is the normal use in which operation of eliminating the already stored arbitrary image data and storing new image data in this area again is included, The flash memory 8a is equipped and used, and in the use which holds the once stored image data as it is, and eliminates it, or cannot overwrite it, the elimination improper memory 8b is used, equipping.

[0023]9 is a key input section and comprises operational mode (the shutter key 9a, a reproduction key, a picture delivery key) of the electronic "still" camera concerned, a switch which sets up various preset values, etc. The state of the key input section 9 is incorporated into CPU(central processing unit) 10.

[0024]CPU10 controls operation of each part according to the state of the program in ROM11, and the switch of the above-mentioned key input section 9. Especially CPU10 stores in the flash memory 8a or the elimination improper memory 8b the image data once stored in DRAM6 mentioned above.

[0025]ROM11 has memorized magnetic besides semiconductor memory, the program which may be the storages which comprised an optical recording medium and is executed by the above-mentioned CPU10, and data. It is equipped with this storage (ROM11), enabling the thing provided fixed or free attachment and detachment. A program, data, etc. which are recorded on a storage (ROM11), It may have composition received and memorized from other apparatus connected via the communication line etc., The above-mentioned storage (ROM11) may be formed in other apparatus side connected via the communication line etc., and it may have composition which uses the program memorized by this storage (ROM11), data, etc. via a communication line.

[0026]Next, 12 is RAM (random access memory) and is used as working area of above-mentioned CPU10. 13 is an I/O Port which functions as an interface which outputs and inputs the video signal etc. which were changed into the serial signal, and especially, in the mode of the 1st operation, when delivering and receiving the image data recorded among other apparatus (for example, an electronic "still" camera, a computer, etc.), it is used. Next, 15 is SG (Signal Generator; video signal generator), it superimposes a chrominance signal on the luminance signal elongated by compression / extension part 7, adds a synchronized signal etc., creates a digital video signal, and outputs it to LCD16. LCD(liquid crystal display) 19 displays an image according to the digital video signal supplied via the buffer 18.

[0027]A-2. Explain operation of the mode of the 1st operation, next the operation of an electronic "still" camera by the mode of the 1st operation mentioned above. The following explanation explains the example which made impossible [ elimination (overwrite) ] the elimination improper memory 8b mentioned above with software.

(a) Memory detection processing drawing 2 is a flow chart for explaining operation of the memory detection processing of the electronic "still" camera mentioned above, and the program shown with this flow chart is stored in ROM11. Drawing 3 and drawing 4 are the key maps for explaining memory detection processing. First, in Step S10, the memory (a flash memory or an elimination improper memory) with which it was equipped via the connector 20 is accessed, and it is judged whether it is equipped with the flash memory 8a according to the response. Here, if the connector is equipped with the flash memory 8a as shown in drawing 3 (a), it will progress to Step S12, and as shown in drawing 3 (b), flag F1 which shows the kind of memory with which it is equipped will be set to "0."

[0028]On the other hand, if not equipped with the flash memory 8a, it progresses to Step S14 and it is judged whether it is equipped with the elimination improper memory 8b. And if the connector is equipped with the elimination improper memory 8b as shown in drawing 4 (a), it will progress to Step S16, and as shown in drawing 4 (b), above-mentioned flag F1 will be set to "1." If equipped with neither of the memories, it progresses to Step S18 and displays not being equipped with the memory for preservation of image data on LCD16.

[0029](b) Image recording processing, next drawing 5 are the flow charts for explaining image recording processing of the electronic "still" camera by the mode of the 1st operation, and the program shown with this flow chart is stored in ROM11. First, the image photoed by CCD1 is incorporated at Step S20. Next, after adding a synchronized signal etc. to the incorporated image data from SG15 at Step S22, creating a digital video signal and changing into an analog signal with D/A converter 17, it displays by LCD16. And if it judges whether the shutter key 9a of the key input section 9 was pressed and is not pushed at Step S24, it returns to Step S20.

Therefore, the image photoed by CCD1 will be displayed on LCD9 by predetermined sampling timing (real time). [0030]On the other hand, in the above-mentioned process, a push on the shutter key 9a will judge whether it is equipped with whether flag F1 which shows the type of a memory with which Step S26 is followed and equipped is "0", and the flash memory 8a. And when equipped with the flash memory 8a. When it progresses to Step S30



and the shutter key 9a is pressed, once storing in DRAM6 the image data which TG4 outputs, it compresses by compression / extension part 7, and stores in the flash memory 8a in the memory with which it is equipped, and this case according to the present writing address. Next, at Step S32, a writing address is updated and it returns to Step S20.

[0031]On the other hand, when flag F1 is "1" (i.e., when equipped with the elimination improper memory 8b), it progresses to Step S28 and it is judged whether the memory area shown with the present writing address is empty area. And if this memory area is empty area, i.e., the area where image data has not been recorded yet, when it will progress to Step S30 mentioned above and the shutter key 9a will be pressed, Once storing in DRAM6 the image data which TG4 outputs, it compresses by compression / extension part 7, and stores in the elimination improper memory 8b in the memory with which it is equipped, and this case according to the present writing address. Next, at Step S32, a writing address is updated and it returns to Step S20.

[0032]The memory area where the memory with which it is equipped is shown with the present writing address by the elimination improper memory 8b not empty area but when image data is already recorded, It returns to Step S20, without displaying the message of the purport that it cannot write in on LCD16, and recording image data at Step S34.

[0033]Hereafter, the image photoed by CCD1 is recorded on the memory with which it equipped then as image data by carrying out repeat execution of Steps S20-S34. When the memory with which it is equipped is the flash memory 8a at this time, Irrespective of whether image data is already recorded on the memory area shown by a writing address, While recording new image data on the memory area, when the memory with which it is equipped is the elimination improper memory 8b, even if it is going to record new image data on the memory area where image data is already recorded, it writes in and refuses as improper.

[0034]Thus, the recorded image data can make elimination improper, without needing complicated operation, since elimination and overwrite of image data which were already recorded are forbidden when [ which was mentioned above ] equipped with the elimination improper memory 8b in the mode of the 1st operation. The recorded image data can make elimination improper, without performing special processing, since the access itself will be refused if it is newly going to store image data in the address with which image data was already stored when the elimination improper memory 8b cannot eliminate by hardware. What is necessary is just to let the elimination improper memory 8b be a new thing, if an availability is lost in the elimination improper memory 8b.

[0035]B. Explain the mode of the 2nd operation, next the mode of operation of the 2nd of this invention.

B-1. The lineblock diagram 6 of the mode of the 2nd operation is a block diagram showing the composition of the electronic "still" camera by the mode of the 2nd operation. The same numerals are attached to the portion corresponding to drawing 1, and explanation is omitted. In a figure, in the mode of the 2nd operation, while establishing permanently the rewritable flash memory 8a, it can equip with the elimination improper memory 8b, enabling free attachment and detachment. With the directions from CPU10, the selection circuitry 21 chooses either one of the flash memory 8a or the elimination improper memory 8b, and connects the data bus and address bus by the side of a memory to the data bus and address bus of CPU10. CPU10 stores image data to the memory selected by this selection circuitry 21. CPU10 can detect now whether it is equipped with the elimination improper memory 8b via the selection circuitry 21.

[0036]B-2. Explain operation of the mode of the 2nd operation, next the operation of the mode of the 2nd operation mentioned above.

(a) In the electronic "still" camera by the mode of the 2nd operation which elimination improper memory detection processing drawing 7 mentioned above, It is a flow chart for explaining operation of the processing which detects whether it is equipped with the elimination improper memory, and the program shown with this flow chart is stored in ROM11. First, in Step S40, wearing of the elimination improper memory 8b is detected via the selection circuitry 21, and it is judged whether based on the detection result, it is equipped with the elimination improper memory 8b at Step S42. And when not equipped with the elimination improper memory 8b. As shown [ Step S44 ] in drawing 8, when the flag F3 which shows wearing / un-equipping is set to "0 (unequipped)" and it is equipped with the elimination improper memory 8b, as shown in drawing 8, the above-mentioned flag F3 is set to "1 (wearing)" at Step S46. Since the flash memory 8a is permanent installation, the flag F2 to this memory is set to "1."

[0037](b) In the electronic "still" camera according [ a selection process, next drawing 9 ] to the mode of the 2nd operation, It is a flow chart for explaining operation of the selection process as which a user is made which of the flash memory 8a or the elimination improper memory 8b, or to choose whether it uses, and the program

shown with this flow chart is stored in ROM11. First, if it judges whether the memory selection key of the key input section 9 was operated, and the memory selection key is not operated at Step S50, it progresses to the processing corresponding to other keys processed or operated and a memory selection key is operated, it will progress to Step S52.

[0038]A user chooses the elimination improper memory 8b, when rewriting the image which chose and photoed the flash memory 8a when the photoed image was made rewritable and it is improper. In Step S52, when it judges whether the flash memory 8a was chosen and the flash memory 8a is chosen, as shown in drawing 10, the flag F4 which shows the selected memory is set to "0 (flash memory)" at Step S54.

[0039]On the other hand, when the elimination improper memory 8b is chosen, it is judged by progressing to Step S56 and referring to the flag F3 whether it is equipped with the elimination improper memory 8b. And if equipped with the elimination improper memory 8b (i.e., if the flag F3 "1" becomes), it will progress to Step S58, and as shown in drawing 10, the flag F4 which shows the selected memory will be set to "1 (elimination improper memory)."

[0040]If the flag F3 "0" Becomes if not equipped with the elimination improper memory 8b namely, it will progress to Step S60, and will indicate that it has not equipped LCD16 with the elimination improper memory 8b, and the above-mentioned flag F4 will be set to "0 (flash memory 8a)" at Step S62.

[0041](c) Image recording processing, next drawing 11 are the flow charts for explaining image recording processing of the electronic "still" camera by the mode of the 2nd operation, and the program shown with this flow chart is stored in ROM11. First, after adding a synchronized signal etc. to the image data which incorporated the image photoed by CCD1 at Step S70, and was incorporated from SG15 at Step S72, creating a digital video signal and changing into an analog signal with D/A converter 17, it displays by LCD16. And if it judges whether the shutter key 9a of the key input section 9 was pressed and is not pushed at Step S74, it returns to Step S70. Therefore, the image photoed by CCD1 will be displayed on LCD9 by predetermined sampling timing (real time).

[0042]On the other hand, in the above-mentioned process, a push on the shutter key 9a will judge whether whether the flag F4 which shows the memory followed and chosen as Step S76 being "0", and the flash memory 8a are chosen. And when the flash memory 8a is chosen. When it progresses to Step S80 and the shutter key 9a is pressed, once storing in DRAM6 the image data which TG4 outputs, it compresses by compression / extension part 7, and stores in the flash memory 8a in the memory with which it is equipped, and this case according to the present writing address. Next, at Step S82, a writing address is updated and it returns to Step S70.

[0043]On the other hand, when the flag F4 is "1" (i.e., when the elimination improper memory 8b is chosen), it progresses to Step S78 and it is judged whether the memory area shown with the present writing address is empty area. And if this memory area is empty area, i.e., the area where image data has not been recorded yet, when it will progress to Step S80 mentioned above and the shutter key 9a will be pressed, Once storing in DRAM6 the image data which TG4 outputs, it compresses by compression / extension part 7, and stores in the elimination improper memory 8b in the memory with which it is equipped, and this case according to the present writing address. Next, at Step S82, a writing address is updated and it returns to Step S70.

[0044]The memory area which the memory chosen is the elimination improper memory 8b, and is shown with the present writing address not empty area but when image data is already recorded, It returns to Step S70, without displaying the message of the purport that it cannot write in on LCD16, and recording image data at Step S84.

[0045]Hereafter, the image photoed by CCD1 is recorded on the memory chosen as image data by carrying out repeat execution of Steps S70-S84. When the memory chosen is the flash memory 8a at this time, new image data is recorded on that memory area irrespective of whether image data is already recorded on the memory area shown by a writing address. On the other hand, when the memory chosen is the elimination improper memory 8b, even if it is going to record new image data on the memory area where image data is already recorded, it writes in and refuses as improper.

[0046]Thus, the recorded image data can make elimination improper, without needing complicated operation, since elimination and overwrite of image data which were already recorded are forbidden when [ which was mentioned above ] the elimination improper memory 8b is chosen in the mode of the 2nd operation. When the elimination improper memory 8b cannot eliminate by hardware, The recorded image data can make elimination improper, without performing special processing, since the access itself will be refused if it is newly going to store image data in the address with which image data was already stored like the mode of the 1st operation. What is necessary is to remove the elimination improper memory 8b and just to equip with a new thing, if an



availability is lost in the elimination improper memory 8b.

[0047]C. Explain the mode of the 3rd operation, next the mode of operation of the 3rd of this invention.

C-1. The lineblock diagram 12 of the mode of the 3rd operation is a block diagram showing the composition of the electronic "still" camera by the mode of the 3rd operation. The same numerals are attached to the portion corresponding to drawing 1, and explanation is omitted. In a figure, have established permanently only the rewritable flash memory 8a in the mode of the 3rd operation, and to this flash memory 8a. While the image data (a luminance signal and a chrominance signal) compressed by compression / extension part 7 is stored, as shown in drawing 13, the address with which image data is stored in every image data (storage area), and elimination good / improper information WE which shows whether it is improper whether elimination is good are stored. Elimination good / improper information WE is in the state where image data is not stored, and once it is set to "0" and image data is stored, it will serve as an elimination failure "1." And in the state where elimination good / improper information WE serves as an elimination failure "1", image data cannot newly be stored (overwrite). However, by processing mentioned later, this elimination good / improper information WE can be referred to as "0" in entering a password, and can cancel an elimination failure now.

[0048]C-2. Explain operation of the mode of the 3rd operation, next the operation of the mode of the 3rd operation mentioned above.

(a) Image recording processing drawing 14 is a flow chart for explaining image recording processing of the electronic "still" camera by the mode of the 3rd operation, and the program shown with this flow chart is stored in ROM11. First, the image photoed by CCD1 is incorporated at Step S90, and at Step S92, a synchronized signal etc. are added to the image data incorporated from SG15, a digital video signal is created, and it displays by LCD16. And if it judges whether the shutter key 9a of the key input section 9 was pressed and is not pushed at Step S94, it returns to Step S90. Therefore, the image photoed by CCD1 will be displayed on LCD9 by predetermined sampling timing (real time).

[0049]On the other hand, in the above-mentioned process, if the shutter key 9a is pressed, it will progress to Step S96. It is judged whether it is good (overwrite is possible) in whether elimination good / improper information WE corresponding to the storage area of the image data shown with the present writing address that it corresponds with reference to the header unit of the flash memory 8a is "0", and elimination. And when elimination good / improper information WE is "0." When it progresses to Step S98 and the shutter key 9a is pressed, once storing in DRAM6 the image data which TG4 outputs, it compresses by compression / extension part 7, and stores in the flash memory 8a according to the present writing address. Next, at Step S100, it supposes that it is impossible, "1", i.e., elimination, of elimination good / improper information WE that it corresponds, and by Step S102, a writing address is updated and it returns to Step S90.

[0050]On the other hand, if it puts in another way when elimination good / improper information WE is "1" (i.e., when the storage area (image data) of the image data shown with the present writing address is set up improper [ elimination ]), When image data is already stored, it progresses to Step S104, and after displaying the message which writes in LCD16 and tells an improper purport, it returns to Step S90. Therefore, the image data already stored in this case is not rewritten.

[0051]In the reproduction mode which displays the image data stored in the flash memory 8a on LCD16, If the "-" key which functions as an instruction key for retreating "+" which functions as an instruction key for advancing one recorded image data, or one recorded image data is pressed, according to the picture data address of a header unit, image data will be sent (attitude) and it will display by LCD16. Here, drawing 15 is a key map showing the display example at the time of reproduction of image data. In the figure, the number given to the upper right corner of each image data is a number of image data, and it is shown that "WP" is image data set up improper [ elimination of the image data ] ("1"). Namely, "2", "4", "6" .... The image data of "n" is set up improper [ elimination ].

[0052](b) In the mode of the 3rd operation, release processing drawing 16 by entering a password to the already stored image data, Elimination good / elimination improper information WE is called off, and elimination being good (writing's is possible) and the program which is the flow charts for explaining the release processing to carry out, and is shown with this flow chart are stored in ROM11. First, it is judged at Step S110 whether the "+" key is pushed on the power up. Here, if "+" or the "-" key is pressed, it will progress to Step S112, image data will be sent according to the picture data address of a header unit (attitude), and it will display at Step S114 LCD16. As mentioned above, image data is displayed on LCD16 as "WP" in which it is shown that it is the image data set up improper [ elimination ] ("1").

[0053]Next, it is judged at Step S116 whether the user entered the password from the key input section 9. And

if a password is not entered, it returns to Step S110. A user presses "+" and the "-" key and makes image data move until the image data which wants to cancel setting out of not being eliminable is displayed. And a display of predetermined image data will enter a password. If a password is entered, will progress to Step S118 and the password set up beforehand will be read from RAM12 (or flash memory 8a). It judges whether the entered password and the password set up beforehand are in agreement, and if not in agreement, it returns to Step S110 as it is. Therefore, setting out to the image data currently displayed on LCD16 in this case which is not eliminable is not canceled.

[0054] On the other hand, if both passwords are in agreement, it will suppose that it is possible, "0", i.e., elimination, of elimination good / improper information WE on the image data which progresses and corresponds to Step S120, and will return to Step S110. Therefore, setting out to the image data currently displayed on LCD16 in this case which is not eliminable can be canceled, and the newly photoed image data can be stored now.

[0055] Thus, in the mode of the 3rd operation mentioned above. In every image data (storage area), elimination good / improper information WE which shows whether elimination is good or elimination is improper is formed so that setting out is possible. Since it supposes that elimination of elimination good / improper information WE that it corresponds is impossible and elimination (overwrite) was refused after that once it stored image data, the stored image data can be protected. When the password set up beforehand is entered, Since elimination good / improper information WE corresponding to image data present on display is called off and it was made to consider it as elimination C (overwrite), For example, it can be used as it is, without making useless hardware resources (flash memory 8b), even when the protected image data is transmitted and image data becomes unnecessary.

[0056] Although it communicated with infrared rays among both electronic "still" cameras and image data was transmitted, it may be made to transmit via a communication line in picture transmitting processing in the mode of the operation mentioned above not only with this but with a cable, radio, or a modem.

[0057] D. Explain the mode of the 4th operation, next the mode of operation of the 4th of this invention.

D-1. The lineblock diagram 17 of the mode of the 4th operation is a block diagram showing the electronic camera system by the mode of operation of the 4th of this invention. In the figure, the electronic camera 21 has composition almost equivalent to what was explained to drawing 12. The electronic camera 21 has a predetermined communications protocol, may carry out direct continuation to the communication line 22, and may be connected via the personal computer (PC) 23. The electronic camera 21 and 21 comrades may be connected in infrared-ray-communication 24 grade. When the provider 25 connects with the communication line 22, various services about transmission of a picture can be offered.

[0058] D-2. Explain operation of the mode of the 4th operation, next the operation of the mode of the 4th operation mentioned above. Drawing 18 and drawing 19 are the flow charts explaining operation of the mode of the 4th operation. Imaging mode, reproduction mode, and edit mode are prepared for the electronic camera 21 by the mode of the 4th operation. First, mode discrimination is made by Step S201. When distinguished from imaging mode, it progresses to Step S202.

[0059] (a) In the mode of operation of the photographing mode 4th, it has two-step composition, and it is PURISHATTA (half press of the shutter key 9a), and the shutter key 9a performs processing of predetermined [such as auto-focusing, ], for example, and records a picture by this shutter aggressiveness. By Step S202 and the loop of S203, the image picturized from CCD1 is captured into DRAM6 after performing predetermined image processing, and the monitor display is performed to LCD16 as a viewfinder until PURISHATTA is pushed. If PURISHATTA aggressiveness is detected at Step S202, it will progress to Step S204.

[0060] In Step S204, it is judged whether it is in change improper mode. In the mode of the 4th operation, the mode picturized as change of an image pick being impossible and the mode picturized as edit being possible can be changed and chosen. When set as the change improper mode, it progresses to Step S205 and an alarm display is performed. Since the picture which picturized this warning in the change improper mode cannot perform edit and rewriting, it is a warning message to which judgment of being the image pick-up O.K. is urged in that state. It can be designed suitably whether elimination of the picture picturized in the change improper mode is forbidden or elimination is made possible.

[0061] Next, in Step S206, auto-focusing and predetermined processing which should be processed before this shutter aggressiveness are performed, for example, and it is judged whether this shutter was pushed at Step S207. And if the loop of Steps S202-S207 is repeated and this shutter aggressiveness is detected at Step S207 until this shutter is pushed, it will progress to Step S208.

[0062]Here, it judges whether it is in change improper mode again, and if it is not in change improper mode, it will progress to Step S209 and the usual image pick-up processing will be performed. That is, compression / extension part 7 performs predetermined compression processing, and the picture captured into DRAM6 is written in the flash memory 8a. If it is in change improper mode, at Step S210, predetermined processing mentioned later will be performed, a picture will be made unchangeable, and it will write in the flash memory 8a. It does not write in, when it distinguishes whether the change improper flag mentioned later is given to the existing image data when overwriting the existing image data memorized by the flash memory 8a at this time, and the change improper flag is given. It may be made to display the message for notifying a user of it being unchangeable at this time. The existing image data which cannot change and is memorized by this can be prevented from being changed (overwrite). And it progresses to Step S211, key detection of a mode change etc. is performed, and it returns to Step S201.

[0063]Next, the details of the above-mentioned step S210 for memorizing as change of a picture being impossible are explained with reference to drawing 19. In Step S221, a picture and a change improper flag are matched and it once memorizes in DRAM6. A change improper flag is a specific code generated or it memorizes in the main part of the electronic camera 21. And at Step S222, the picture is made together with a change improper flag, and it enciphers. Although RSA etc. are known variously, since the existing enciphering method can be used for the technique of encryption by this invention, explanation is omitted.

[0064]As shown in drawing 21 (a) and (b), the technique of mixing a picture and a change improper flag may only be added to the beginning of a picture, or the last, and as shown in drawing 21 (c), it may be added in two dimensions. As shown in drawing 22, it may compound so that a picture and a change improper flag may be piled up. The same pixel number as a picture may be sufficient as the change improper flag in this case, and a different pixel number is also available for it.

[0065]On the other hand, digital watermarking is known although it differs from encryption for a while. The outline is shown in drawing 23. Predetermined text information is embedded at a source image, and it is memorized to the flash memory 8a at Step S223. Although a source image here is a picture which mixed the change improper flag, it is good also considering the picture before mixing a change improper flag as a source image. Although the text information embedded gives the simple example here, it may be more complicated and picture information may be sufficient as it. A change improper flag can be embedded and it can also adopt as text information. as art of digital watermarking, there are U.S. patent application USP5,530,859, USP5,636,292, USP5,568,570, international patent application WO96-36163 and WO96-27259, and WO95-14289 grade, for example. Since the existing electronic watermark method is employable in this invention, explanation is omitted.

[0066](b) Explain reproduction mode, next reproductive operation with reference to drawing 24. If it is set as reproduction mode by operation of the key input section 9, a picture will be specified by a certain method by Step S231. This specification is good also as a picture picturized at the end, and may be specified by a number etc. And if it judges whether the specified picture is enciphered and is not enciphered at Step S232, repeat display processing is performed as it is at Step S234. On the other hand, if enciphered, after decoding, it will express as Step S233. When digital watermarking is embedded, it dissociates within Step S233. The method of leaving as it is and reproducing text information may be sufficient as the picture where, as for this separation, text information was embedded, and the method of removing text information thoroughly may be sufficient as it.

[0067]And display processing of the picture decoded at Step S234 is performed. Since it is always enciphered, the picture made impossible [ change ] is not reproduced with the image processing device etc. which do not have a decipherment function. And it is designed perform only the output of built-in LCD16, and the video output has come to be unable to perform an analog output and a digital output in display processing of this step S234. It is because it may be received and changed with another image processing device etc. if a video output is carried out.

[0068](c) a transmitting mode --- here explains operation of the picture transmission by the means of communication of the electronic camera 21 with reference to drawing 25. Since Step S240, S241, and S242 are the same as that of Step S231 shown in drawing 24, S232, and S233, they omit explanation. If the specified picture is changeable, it will transmit as it is at Step S243. On the other hand, if the specified picture is unchangeable, the message which shows that it cannot transmit at Step S244 will be displayed.

[0069]Thus, the picture which is set up improper [ change ] in the picture transmission by the means of communication of the electronic camera 21 of the mode of the 4th operation is designed not transmit. Also when carrying out collective sending of all the pictures memorized by the flash memory 8a, only the picture which is not set up improper [ change ] is transmitted selectively. Therefore, it is received by another image

processing device etc. and can prevent seeing or being changed.

[0070](d) Explain edit mode, next operation of edit with reference to drawing 26. Since Step S251, S252, and S253 are the same as that of Step S231 shown in drawing 24, S232, and S233, they omit explanation. The point of difference with reproduction is a point which can change and re-write in a picture by edit to only seeing a picture in reproduction. That is, the specified picture distinguishes whether it is set up improper [ change ] at Step S254. If change is good, repeat display processing will be performed like Step S234 of drawing 24 at Step S255. And after performing editing processing at Step S256, the picture after edit is written in the flash memory 8a at Step S257. Therefore, a picture will be changed. Since the editing processing itself is publicly known, explanation is omitted. On the other hand, if judged with change being impossible at Step S254, at Step S258, a message [ that it cannot edit ] will be displayed and it will return to a step. Therefore, a picture is not changed. [0071]

[Effect of the Invention] Since the image photoed by said photographing device was memorized as image data by the storage control means to either one of said 1st memory measure or said 2nd memory measure according to the invention according to claim 1, The advantage that the photoed image as it is can memorize as image data in the 2nd memory measure is acquired.

[0072] Since according to the invention according to claim 2 said 1st memory measure and the 2nd memory measure are made removable and it was equipped with either at once, to the 2nd memory measure. While the photoed image as it is can memorize as image data, to memorize the photoed image data so that rewriting is possible. It equips with the 1st memory measure and the photoed image data is rewritten, and the advantage that a photograph can be taken by both of the methods by equipping with the 2nd memory measure according to the purpose is acquired for it to be improper and memorize.

[0073] According to the invention according to claim 3, by a selecting means, choose as which of said 1st memory measure or said 2nd memory measure whether image data is memorized, and said storage control means, Since the image photoed by said photographing device was memorized as image data to the memory measure with said selected selecting means, to the 2nd memory measure. While the photoed image as it is can memorize as image data, to memorize the photoed image data so that rewriting is possible. The 1st memory measure is chosen, the photoed image data is rewritten, and the advantage that a photograph can be taken by both of the methods only by choosing the 2nd memory measure according to the purpose is acquired for it to be improper and memorize.

[0074] Since the identification information which answers operation of a directing means and shows that it is unchangeable in a picture to an image pick is added and memorized according to the invention according to claim 4, the advantage that it can prevent changing the photoed picture later is acquired. Since the picture set up improper [ change ] is enciphered and memorized with identification information according to the invention according to claim 5, Since it is undecipherable without a decoding means, and identification information is also decoded and recognized when there is a decoding means and it decodes, change can be prevented by that cause, and when it is going to reproduce with devices other than the electronic camera picturized especially, the advantage of being effective is acquired.

[0075] Since predetermined information is embedded in the picture set up improper [ change ] according to the invention according to claim 6, Since it is undecipherable without the separating mechanism which separates predetermined information, and identification information is also recognized when there is separating mechanism and it decodes, change can be prevented by that cause, and when it is going to reproduce with devices other than the electronic camera picturized especially, the advantage of being effective is acquired. According to the invention according to claim 7, if a photography person picturizes while monitoring the reproduction means as a finder toward a photographic subject, the advantage that it can recognize that change becomes impossible as for the picture will be acquired. According to the invention according to claim 8, before a photography person pushes a shutter, if it picturizes, the advantage that it can recognize that change becomes impossible as for the picture will be acquired.

[0076] According to the invention according to claim 9, the advantage that two or more memory measures can be used, or the memory measure removed from the main part of an electronic camera can be used with other electronic camera and other devices is acquired. According to the invention according to claim 10, the advantage that it can be chosen whether the picture picturized according to a situation is made into what can be edited later, or it is supposed that change is impossible is acquired. According to the invention according to claim 11, since the picture which cannot be edited at the time of edit is not displayed and only the picture which can be edited is reproduced, the advantage that it is intelligible is acquired. According to the invention according

to claim 12, the advantage that the photoed picture can be transmitted to other electronic camera and other devices via a means of communication is acquired.

[0077]According to the invention according to claim 13, the advantage that shutter operation can be performed is acquired from other information machines and equipment and other electronic cameras. According to the invention according to claim 14, in the electronic camera system which consists of the electronic camera and means of communication which were connected via the communication line, and information machines and equipment, the advantage that it can prevent changing the photoed picture later is acquired. According to the invention according to claim 15, the advantage that the picture set up improper [ change ] is unchangeable by a receiver even if it exchanges a picture via a communication line is acquired. According to the invention according to claim 16, the advantage that it is memorizable in the state [ that an imaging means cannot be controlled and the picturized picture cannot be changed ] is acquired by making a program code read into a computer and executing it.

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[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a block diagram showing the composition of the electronic "still" camera by the mode of 1 operation of this invention.

[Drawing 2]It is a flow chart for explaining operation of the memory detection processing of an electronic "still" camera.

[Drawing 3]It is a key map for explaining memory detection processing.

[Drawing 4]It is a key map for explaining memory detection processing.

[Drawing 5]It is a flow chart for explaining image recording processing of the electronic "still" camera by the mode of the 1st operation.

[Drawing 6]It is a block diagram showing the composition of the electronic "still" camera by the mode of the 2nd operation.

[Drawing 7]It is a flow chart for explaining operation of the processing which detects whether it is equipped with the elimination improper memory by the mode of the 2nd operation.

[Drawing 8]In the electronic "still" camera by the mode of the 2nd operation, it is a key map for explaining the flag which shows whether it is equipped with the elimination improper memory.

[Drawing 9]In the electronic "still" camera by the mode of the 2nd operation, it is a flow chart for explaining operation of the selection process as which a user is made to choose whether either a flash memory or an elimination improper memory is used.

[Drawing 10]In the electronic "still" camera by the mode of the 2nd operation, it is a key map for explaining the flag which shows a memory with the selected user.

[Drawing 11]It is a flow chart for explaining image recording processing of the electronic "still" camera by the mode of the 2nd operation.

[Drawing 12]It is a block diagram showing the composition of the electronic "still" camera by the mode of the 3rd operation.

[Drawing 13]In the electronic "still" camera by the mode of the 3rd operation, it is a key map for explaining the information stored in the flash memory.

[Drawing 14]It is a flow chart for explaining image recording processing of the electronic "still" camera by the mode of the 3rd operation.

[Drawing 15]It is a key map showing the display example at the time of reproduction of image data.

[Drawing 16]In the mode of the 3rd operation, they are that elimination is good (writing is possible) and a flow chart for explaining the release processing to carry out by entering a password.

[Drawing 17]It is a block diagram showing the electronic camera system by the mode of operation of the 4th of this invention.

[Drawing 18]It is a flow chart for explaining the photographing mode operation (1/3) by the mode of the 4th operation.

[Drawing 19]It is a flow chart for explaining the photographing mode operation (2/3) by the mode of the 4th operation.

[Drawing 20]It is a flow chart for explaining the photographing mode operation (3/3) by the mode of the 4th operation.

[Drawing 21]It is a key map for explaining the additional means of the change improper flag in the case of making image data unchangeable.

[Drawing 22]It is a key map for explaining the additional means of the change improper flag in the case of making image data unchangeable.

[Drawing 23]It is a key map at the time of using digital watermarking.

[Drawing 24]It is a flow chart for explaining the reproduction mode operation by the mode of the 4th operation.

[Drawing 25]It is a flow chart for explaining the transmitting-mode operation by the mode of the 4th operation.

[Drawing 26]It is a flow chart for explaining the edit mode operation by the mode of the 4th operation.

[Description of Notations]

1 CCD (photographing device)

3 A/D converter

4 TG

5 Drive circuit

6 DRAM

7 Compression/extension part

8a Flash memory (the 1st memory measure, a memory measure)

8b Elimination improper memory (the 2nd memory measure)

9 Key input section (a selecting means, input means)

9a Shutter key (directing means)

10 CPU (a storage control means, a rewriting improper setting-out means, a decision means, a switching means, a control means, an encoding means, a decoding means, an embedding means, separating mechanism, warning means)

11 ROM (a storage control means, a rewriting improper setting-out means, a control means, an encoding means, a decoding means, an embedding means, separating mechanism, warning means)

12 RAM

13 I/O Port (means of communication)

15 SG

16 LCD (a displaying means, warning means)

20 Connector (detection means)

21 Selection circuitry

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[Translation done.]

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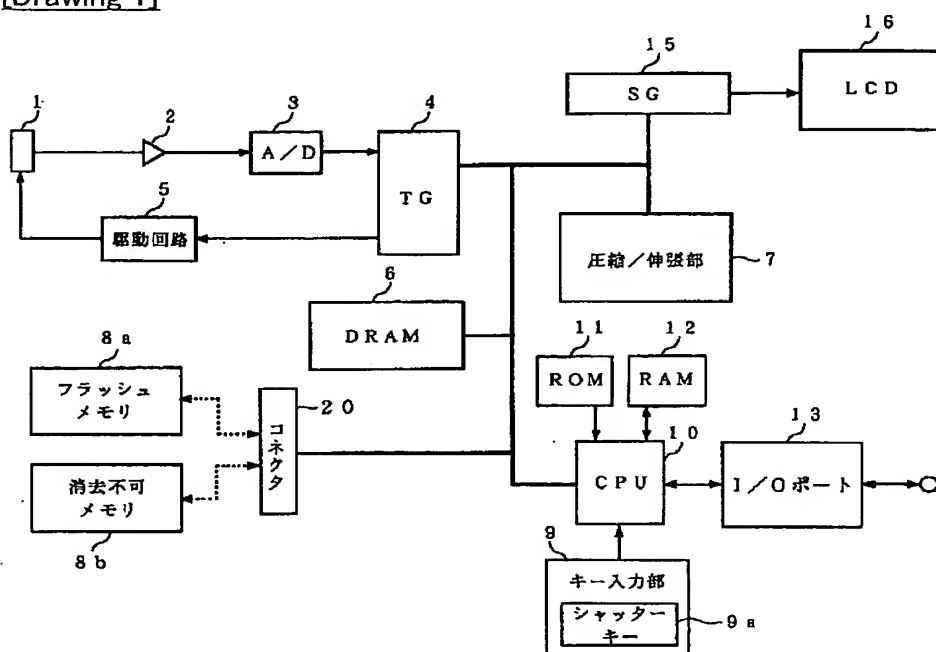
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- 2.\*\*\*\* shows the word which can not be translated.



3. In the drawings, any words are not translated.

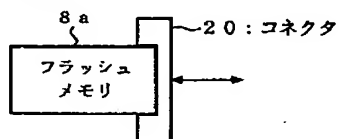
## DRAWINGS

[Drawing 1]

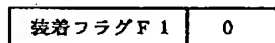


[Drawing 3]

(a)

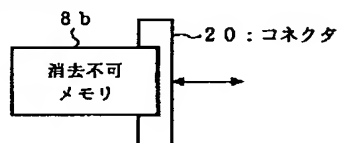


(b)

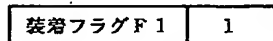


[Drawing 4]

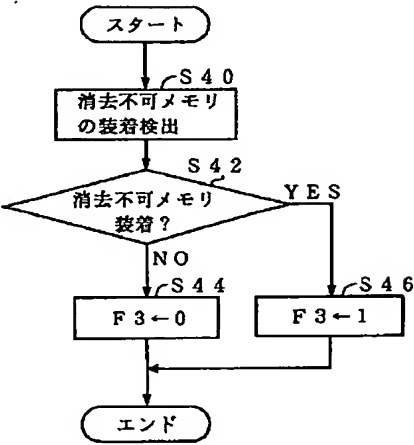
(a)



(b)



[Drawing 7]



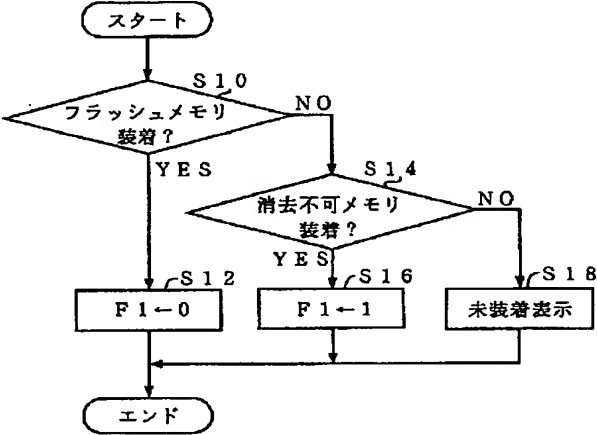
[Drawing 8]

フラッシュメモリ (F 2)	1	
消去不可メモリ (F 3)	0 / 1	0 : なし 1 : あり

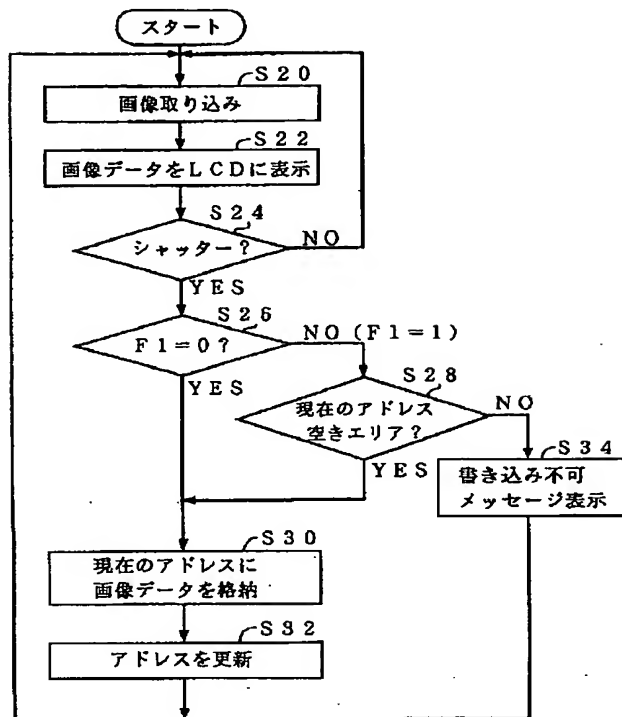
[Drawing 10]

選択メモリ (F 4)	0 / 1	0 : フラッシュメモリ 1 : 消去不可メモリ
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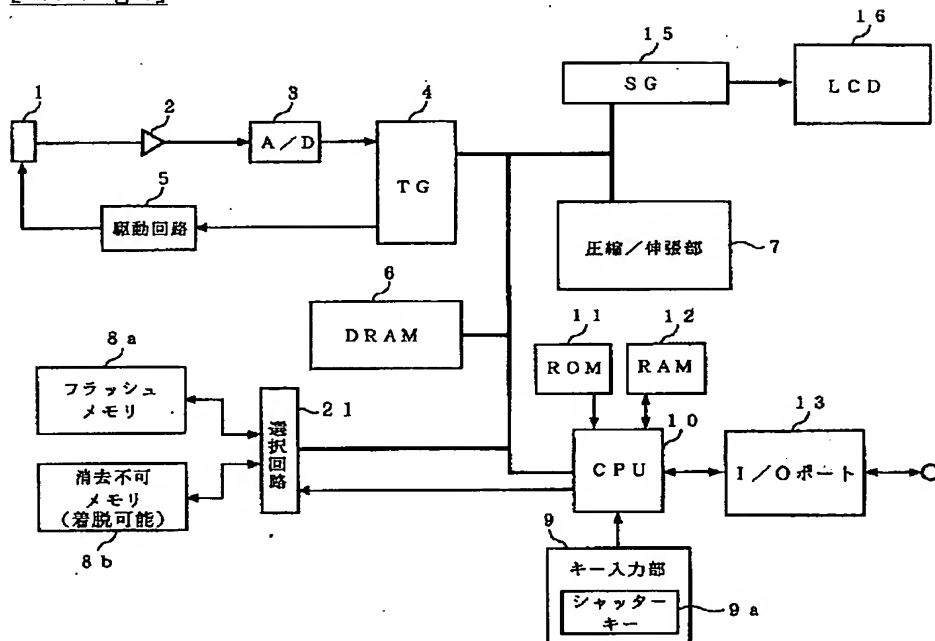
[Drawing 2]



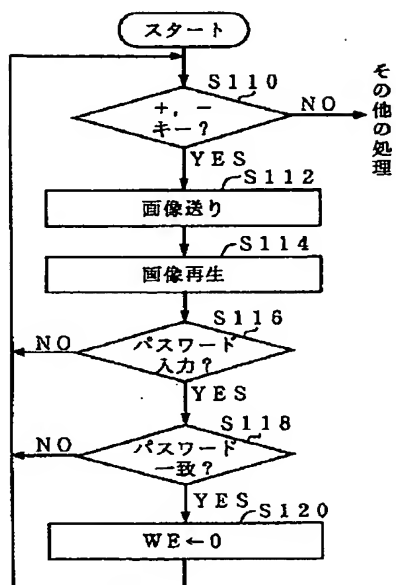
[Drawing 5]



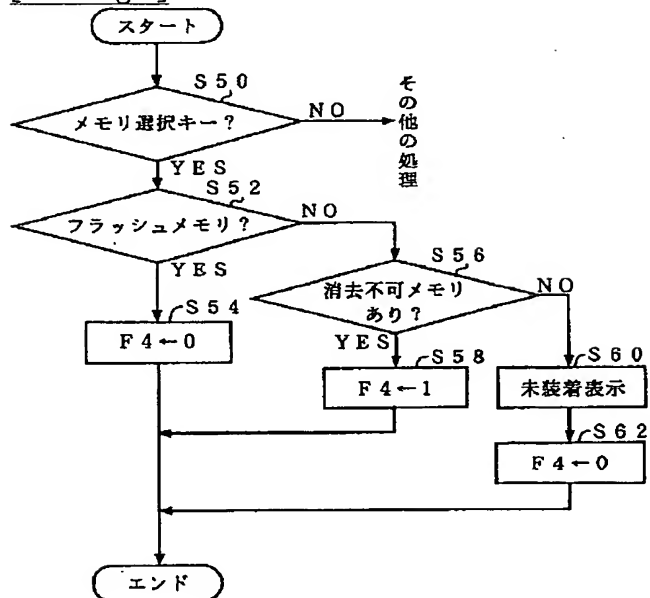
[Drawing 6]



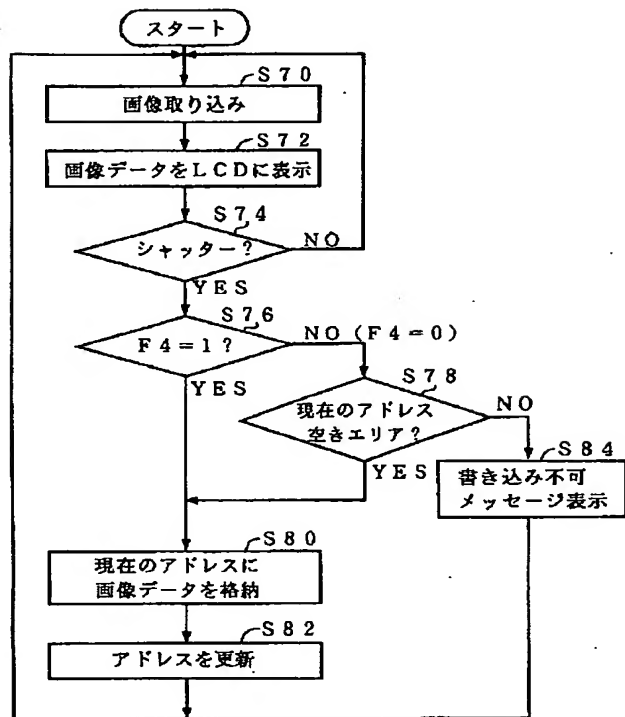
[Drawing 16]



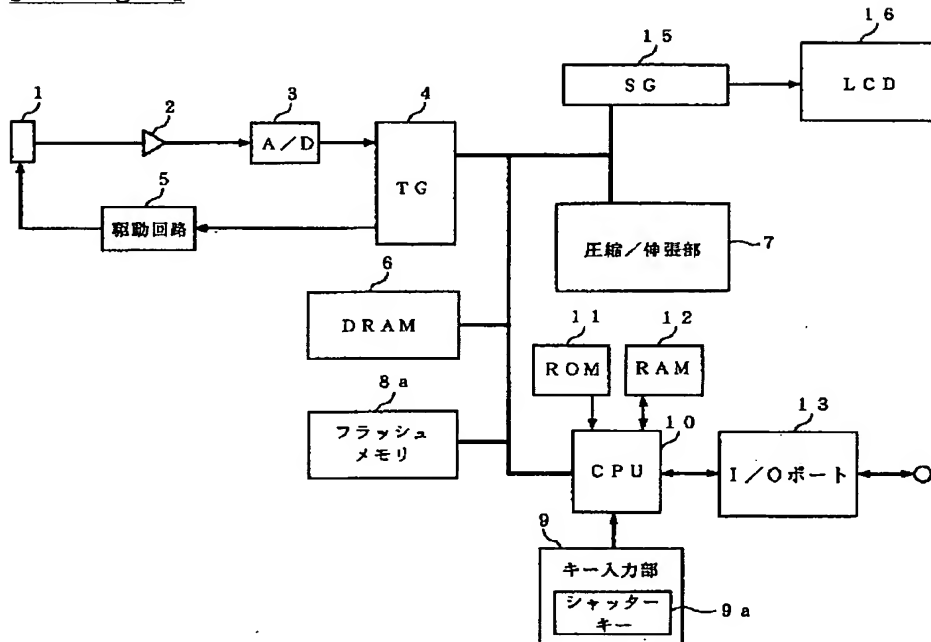
[Drawing 9]



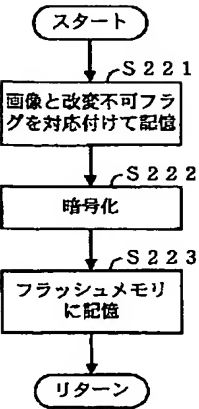
[Drawing 11]



[Drawing 12]



[Drawing 20]



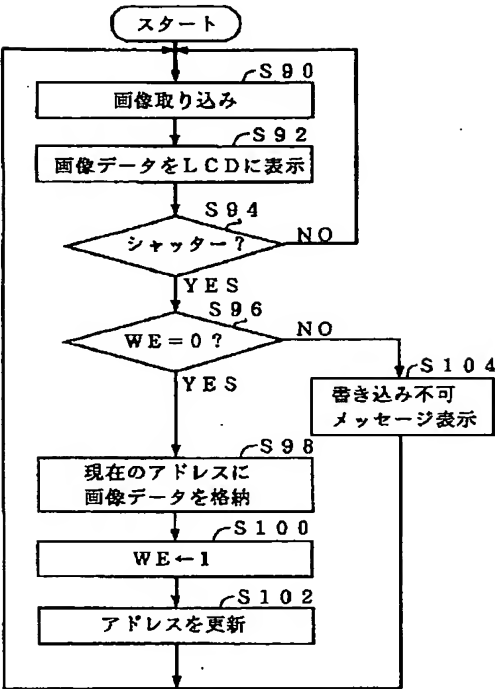
[Drawing 13]

1 枚目の画像データ	画像データアドレス
	消去可／不可情報
2 枚目の画像データ	画像データアドレス
	消去可／不可情報
3 枚目の画像データ	画像データアドレス
	消去可／不可情報
⋮	
n 枚目の画像データ	画像データアドレス
	消去可／不可情報

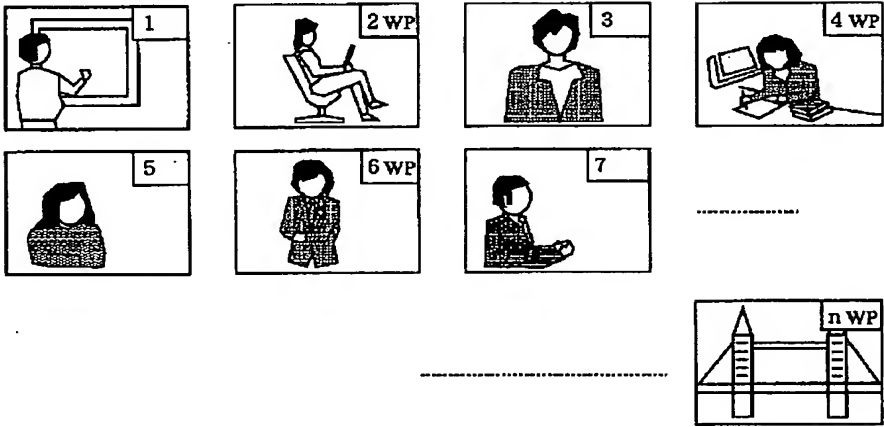
消去可／不可情報：W E  
0：消去可  
1：消去不可

[Drawing 14]

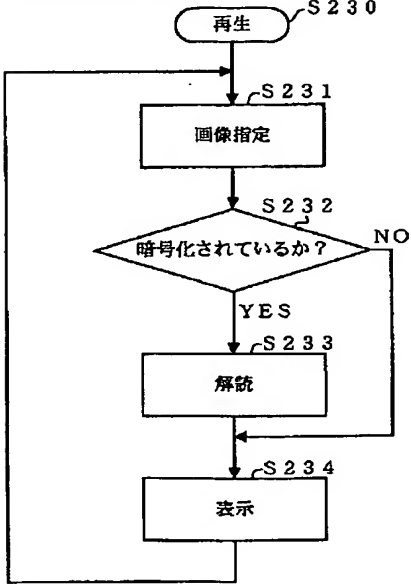




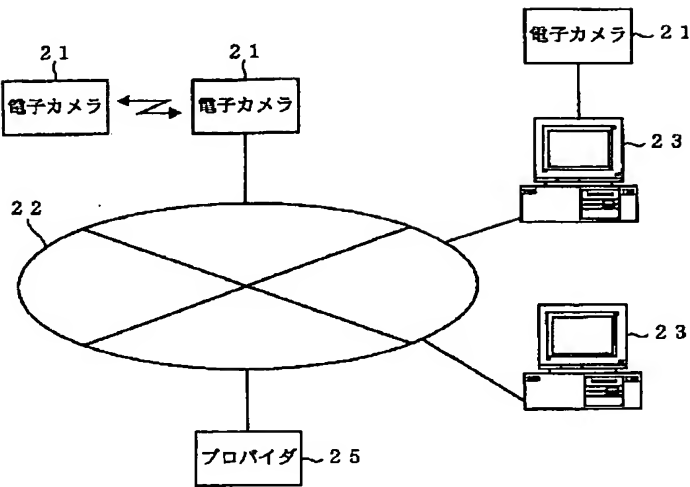
[Drawing 15]



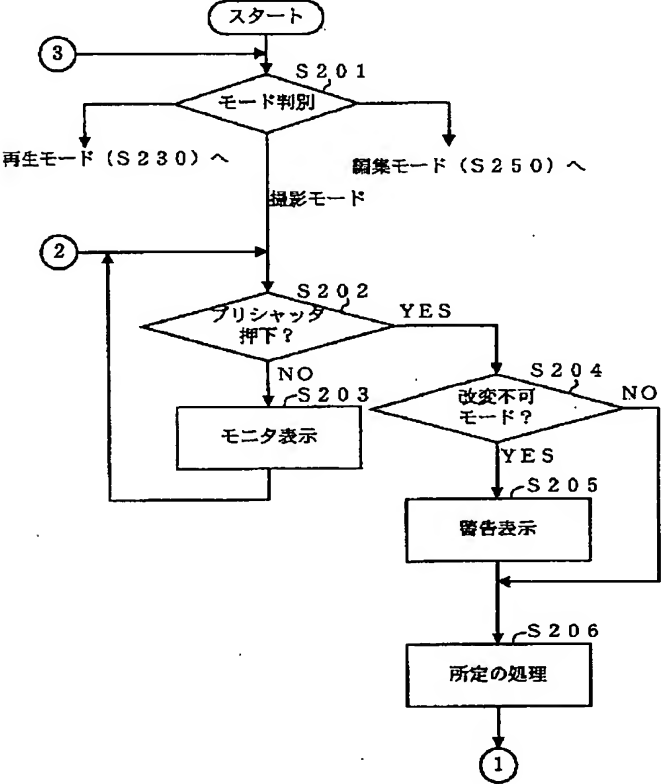
[Drawing 24]



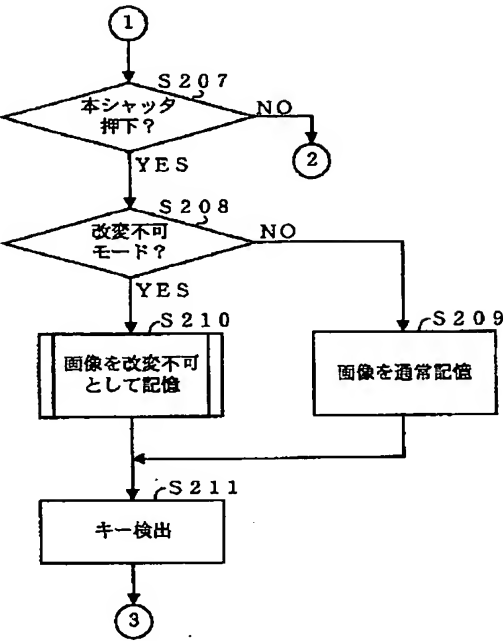
[Drawing 17]



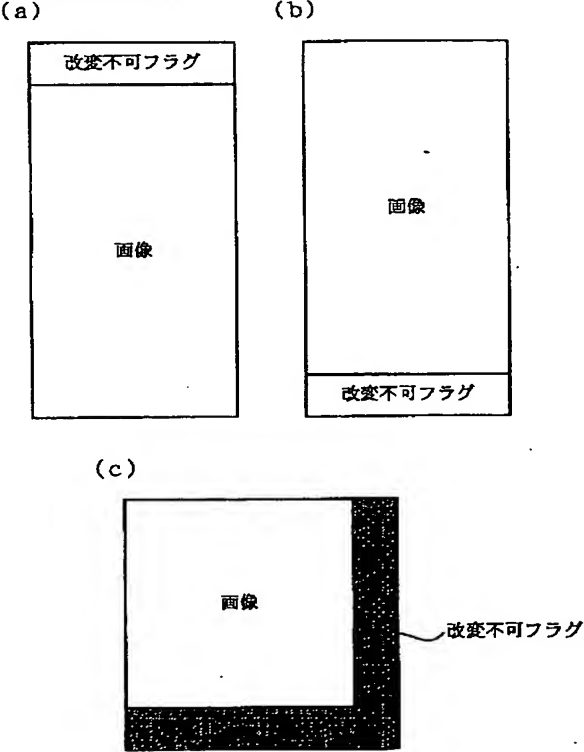
[Drawing 18]



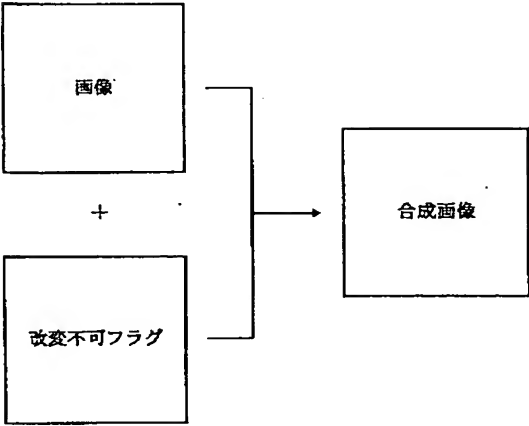
[Drawing 19]



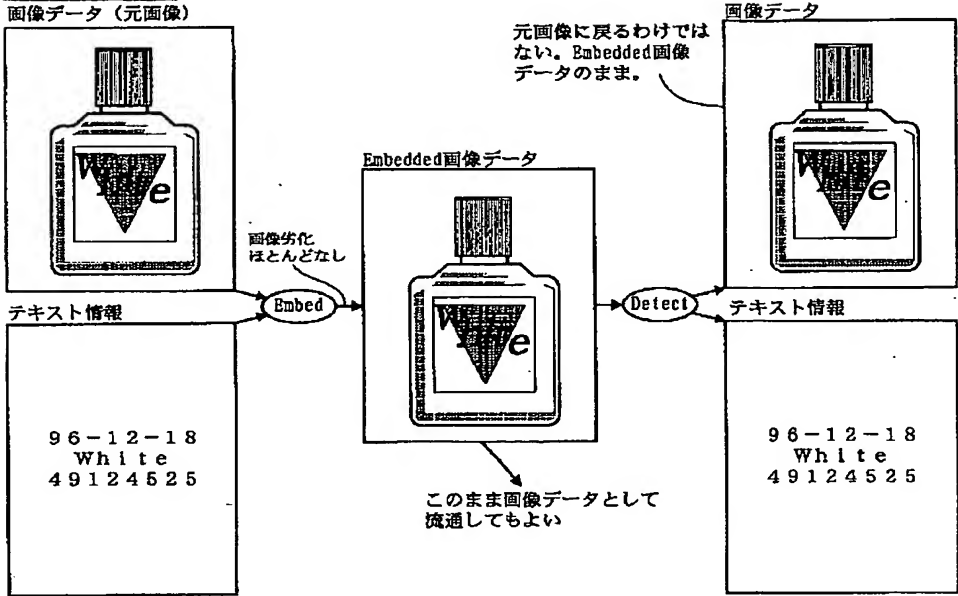
[Drawing 21]



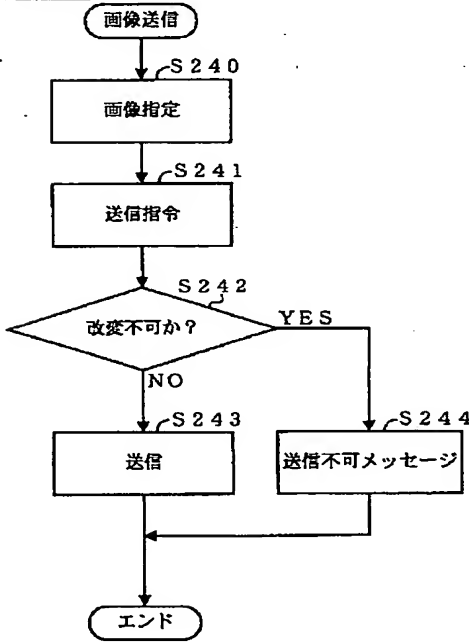
[Drawing 22]



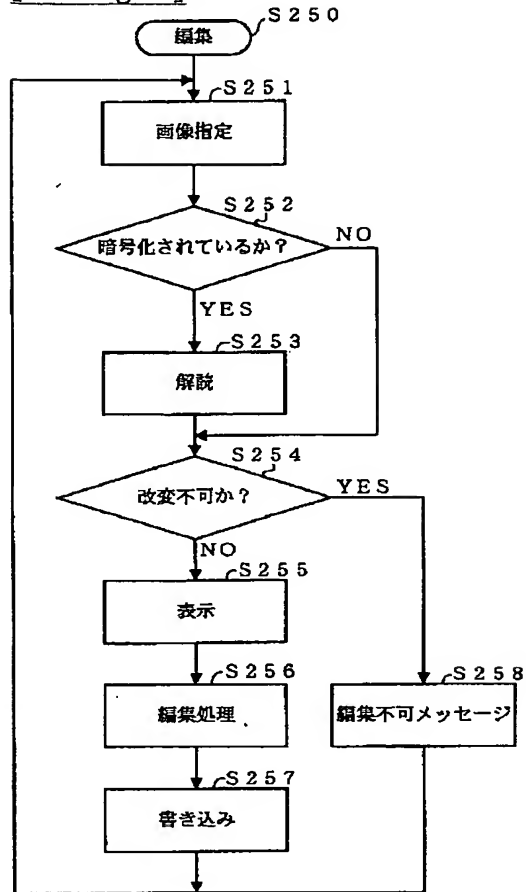
[Drawing 23]



[Drawing 25]



[Drawing 26]



[Translation done.]

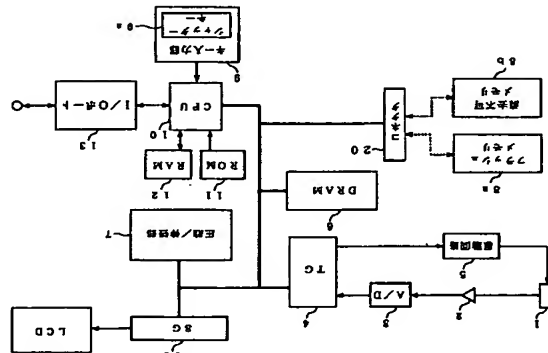
(51)Int.Cl. H 04 N 5/765 5/781 G 06 T 1/60 H 04 N 5/225 5/907	FI H 04 N 5/781 510 E 5/225 F 5/907 B G 06 F 15/64 450 A	審査請求 未請求 請求項の数16 FD (全18頁)
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(32)優先日 平8(1996)12月30日		
(33)優先権主張国 日本(JP)		

(54) 【発明の名称】 電子撮像装置、電子カメラシステムおよび記憶媒体

【57】【要約】

【課題】 撮像した画像を改変不可の状態に記憶できる電子撮像装置を提供する。

【解決手段】 CCD1で撮像した画像をCPU10のA/D変換器3でデジタルデータに変換制御により、A/伸張部7で圧縮した後、消去不可メモリ8bへ、圧縮/伸張部7で圧縮した後、消去不可メモリ8bへ改変不可の状態で記憶する。その際、消去不可メモリ8bの装置ラフF1を輸出して、消去不可メモリ8bへの画像の書き込み可否を判断する。





グラムコードと、前記画像された画像または前記記憶手段に記憶された画像を再生させるプログラムコードと、前記シャッター操作に応じて、前記画像に改変不可であることを示す識別情報を付加するプログラムコードと、

前記記憶手段に対する書き込み制御時に、前記識別情報を検出し、前記画像に前記識別情報が付加されている場合には、書き込み処理を行わないよう制御すべく、前記記憶手段に記憶された画像を改変不可とするプログラムコードとを具備したことを特徴とする記憶媒体、

【発明の詳細な説明】

【0001】  
【発明の属する技術分野】本発明は、画像を画像して記憶する電子画像装置、撮像した画像を伝送する電子カメラシステム、および画像の撮像、記憶、再生制御を行うプログラムコードを記憶した記憶媒体に関する。

【0002】  
【従来の技術】従来より、電子画像装置として、レンズで捉えた光学的な静止画像等をCCD (Charge Coupled Device) 電荷結合素子) やMOS等の撮像素子により電気信号に変換し、半導体メモリや、フロッピーディスク等の記録媒体に記憶する電子スチルカメラが知られている。この電子スチルカメラでは、静止画像等を電氣的な情報として記録しているので、そのままテレビ受像機で再生したり、通信回線を利用して遠隔地に転送したり、赤外線を利用して他の機器 (例えば、他の電子スチルカメラやコンピュータ等) に転送したり、種々の画像処理を施したりすることができるといった特徴を備えている。

【0003】  
【発明が解決しようとする課題】ところで、上述した従来の電子スチルカメラでは、通常、撮影した画像データを自由に書き換えることができるという点が特徴となっている。すなわち、撮影した映像をデジタルデータである画像データとして保持することにより、フィルムを用いるカメラでは不可能な、撮影した画像データを消去したり、画像データ上に新たな画像データを上書きすることが可能になっている。このように、不要な画像データや撮影が失敗した画像データ上に新たに撮影した画像データを書き込むことで、撮影枚数を確保することができ

る。  
【0004】但し、上記電子スチルカメラの使用においても、画像データに手を加えたり、何度か撮影し直したものでなく、フィルムを用いるカメラのように、撮影したそのままの映像が必要になる場合がある。しかしながら、基本的に書き換え可能に画像データを記憶しているため、撮影したそのままの映像を記憶できない、あるいは撮影したそのままの映像であるか確かめることができないという問題があった。

【0005】そこで本発明は、撮影したそのままの映像

であることを警告する警告情報を表示する警告手段を備えていてもよい。

【0013】また、好ましくは、前記指示手段は、例えば請求項8記載のように、2段階の行程をもっており、第1の行程で前記制御手段に前記警告手段を動作させ、第2の行程で前記記憶制御手段に前記撮像手段により撮像された画像に対応する画像を前記記憶手段に書き込む制御を行わせるようにしてもよい。

【0014】また、好ましくは、前記記憶手段は、例えば請求項9記載のように、電子画像装置本体から複製可能に構成されてもよい。

【0015】また、好ましくは、例えば請求項10記載のように、さらに、前記記憶手段に記憶されているデータを送受信する通信手段を備えるようにしてもよい。

【0016】また、好ましくは、例えば請求項11記載のように、さらに、情報機器と接続する接続手段を備え、前記指示手段は、前記接続手段によって接続された情報機器からの信号により動作するようにしてもよい。

【0017】また、好ましくは、前記制御手段は、例えば請求項12記載のように、前記指示手段の操作に応じて前記記憶手段に記憶させる画像を改変可能にするか改変不可にするか選択する選択手段を備えてもよい。また、好ましくは、例えば請求項13記載のように、さらに、前記記憶手段に記憶した画像を編集する編集手段を備え、前記再生手段は、前記編集手段による編集時、前記記憶情報が付加された画像の再生を行わないようにしてもよい。

【0018】また、上記目的を達成するため、請求項14記載による電子カメラシステムでは、通信回線を介して接続された電子カメラと通信手段と情報機器とからなる電子カメラシステムであって、前記電子カメラで撮像した画像を、前記通信回線を介して伝送可能とし、前記電子カメラは前記画像を改変不可に設定して送信する手段を有し、通信回線を介して受信された画像が改変不可に設定されている場合には、受信した側で該画像を改変できないことを特徴とする。また、好ましくは、前記改変不可に設定されている画像は、例えば請求項15記載のように、改変不可であることを示す識別情報がともに暗号化されており、受信側で該暗号にされた画像を解読しても、改変不可であることを示す識別情報が付加されている場合には、該画像を改変できないようにしてもよい。

【0019】また、上記目的を達成するため、請求項16記載による記憶媒体では、コンピュータによって読み取られ実行可能なプログラムコードを記憶する記憶媒体であって、被写体の画像を画像させるプログラムコードと、シャッター操作を行わせるプログラムコードと、このシャッター操作に応じて、前記記憶された画像に対応する画像を記憶手段に記憶させるプログラムコードと、前記記憶手段の書き込みおよび読み出しを制御する

プログラムコードと、前記画像された画像または前記記憶手段に記憶された画像を再生させるプログラムコードと、前記シャッター操作に応じて、前記画像に改変不可であることを示す識別情報を付加するプログラムコードと、前記記憶手段に対する書き込み制御時に、前記識別情報を検出し、前記画像に前記識別情報が付加されている場合には、書き込み処理を行わないよう制御すべく、前記記憶手段に記憶された画像を改変不可とするプログラムコードとを具備したことを特徴とする。

【0020】

【発明の実施の形態】以下、本発明の実施の形態を、電子スチルカメラに適用した一実施の形態として、図面を参照して説明する。

A. 第1の実施の形態

A-1. 電子スチルカメラの構成

図1は本発明の第1の実施の形態における電子スチルカメラの構成を示すブロック図である。図において、1はCCD (またはMOS) であり、図示しないレンズを介して結像した静止映像を電気信号に変換し、バッファ2へ供給する。バッファ2は、上記静止映像信号を所定レベルに増幅した後、A/D変換部3へ供給する。A/D変換部3は、上記静止映像信号をデジタルデータ (以下、画像データという) に変換した後、TG (Timing Generator) タイミング発生器) 4へ供給する。TG4は、CCDを駆動する駆動回路4を制御するためのタイミング信号を生成し、これを駆動回路5へ供給するとともに、このタイミング信号に従って、上記画像データを取り込み、データバスへ出力する。

【0021】次に、6はDRAM (ダイナミックメモリー) であり、上記TG4が出力する画像データを一時記憶する記憶媒体である。この画像データは、1画面分の撮影が終了した時点で読み出され、輝度信号と色信号とを分離する色演算処理が施される。また、7は、色演算処理により分離された上記輝度信号と色信号とを、例えばJPEG (Joint Photographic Coding Experts Group) 方式などの圧縮方式により圧縮する一方、圧縮された画像データを伸張する処理を施す圧縮/伸張部である。8a、8bは、上記圧縮された複数の画像データ (輝度信号と色信号) を格納し、コネクタ20を介して当該装置に複製可能なメモリであり、8aは記憶/消去 (上書き) が可能なフラッシュメモリであり、8bは画像データを記憶できるものの、ソフトウェアまたはハードウェアによって消去 (上書き) が禁止された消去不可メモリである。

【0022】また、本第1の実施の形態では、上記フラッシュメモリ8aまたは消去不可メモリ8bのいずれかをコネクタ20に接続して使用するようにしており、既に格納されている任意の画像データを消去し、数エリアに新たな画像データを再度格納するという操作が含まれる通常の使用の場合、フラッシュメモリ8aを装填して

【0013】また、好ましくは、前記指示手段は、例えば請求項8記載のように、2段階の行程をもっており、第1の行程で前記制御手段に前記警告手段を動作させ、第2の行程で前記記憶制御手段に前記撮像手段により撮像された画像に対応する画像を前記記憶手段に書き込む制御を行わせるようにしてもよい。

【0014】また、好ましくは、前記記憶手段は、例えば請求項9記載のように、電子画像装置本体から複製可能に構成されてもよい。

【0015】また、好ましくは、例えば請求項10記載のように、さらに、前記記憶手段に記憶されているデータを送受信する通信手段を備えるようにしてもよい。

【0016】また、好ましくは、例えば請求項11記載のように、さらに、情報機器と接続する接続手段を備え、前記指示手段は、前記接続手段によって接続された情報機器からの信号により動作するようにしてもよい。

【0017】また、好ましくは、前記制御手段は、例えば請求項12記載のように、前記指示手段の操作に応じて前記記憶手段に記憶させる画像を改変可能にするか改変不可にするか選択する選択手段を備えてもよい。また、好ましくは、例えば請求項13記載のように、さらに、前記記憶手段に記憶した画像を編集する編集手段を備え、前記再生手段は、前記編集手段による編集時、前記記憶情報が付加された画像の再生を行わないようにしてもよい。

【0018】また、上記目的を達成するため、請求項14記載による電子カメラシステムでは、通信回線を介して接続された電子カメラと通信手段と情報機器とからなる電子カメラシステムであって、前記電子カメラで撮像した画像を、前記通信回線を介して伝送可能とし、前記電子カメラは前記画像を改変不可に設定して送信する手段を有し、通信回線を介して受信された画像が改変不可に設定されている場合には、受信した側で該画像を改変できないことを特徴とする。また、好ましくは、前記改変不可に設定されている画像は、例えば請求項15記載のように、改変不可であることを示す識別情報がともに暗号化されており、受信側で該暗号にされた画像を解読しても、改変不可であることを示す識別情報が付加されている場合には、該画像を改変できないようにしてもよい。

【0019】また、上記目的を達成するため、請求項16記載による記憶媒体では、コンピュータによって読み取られ実行可能なプログラムコードを記憶する記憶媒体であって、被写体の画像を画像させるプログラムコードと、シャッター操作を行わせるプログラムコードと、このシャッター操作に応じて、前記記憶された画像に対応する画像を記憶手段に記憶させるプログラムコードと、前記記憶手段の書き込みおよび読み出しを制御する

を画像データとして記憶できる電子画像装置、電子カメラシステムおよび記憶媒体を提供することを目的とする。

【0006】  
【課題を解決するための手段】上記目的の達成のため、請求項1記載の発明による電子画像装置は、映像を撮影する撮影手段と、画像データを書き換え可能に記憶する第1の記憶手段と、画像データを書き換え不可能に記憶する第2の記憶手段と、前記撮影手段により撮影した映像を画像データとして、前記第1の記憶手段または前記第2の記憶手段のいずれか一方に記憶する記憶制御手段とを具備することを特徴とする。

【0007】また、好ましくは、前記第1の記憶手段および第2の記憶手段は、例えば請求項2記載のように、複製可能であり、一度にどちらか一方が装着されるようにしてもよい。

【0008】また、好ましくは、例えば請求項3記載のように、前記第1の記憶手段または前記第2の記憶手段のどちらに画像データを記憶するかを選択する選択手段を具備し、前記記憶制御手段は、前記選択手段により選択された記憶手段に、前記撮影手段により撮影した映像を画像データとして記憶するようにしてもよい。

【0009】また、上記目的を達成するため、請求項4記載による電子画像装置では、被写体の画像を撮像する撮影手段と、前記撮影手段による画像取り込みを指示する指示手段と、前記指示手段の操作に応じて前記撮像手段により撮像された画像に対応する画像を記憶する記憶手段と、前記記憶手段の書き込みおよび読み出しを制御する記憶制御手段と、前記撮像手段により撮像された画像または前記記憶手段に記憶された画像を再生する再生手段とを具備した電子画像装置において、前記指示手段の操作に応じて、前記画像に改変不可であることを示す識別情報を付加する制御手段を具備し、前記記憶制御手段は、前記記憶手段に対する書き込み制御時に、既に記憶されている画像に前記識別情報が付加されている場合には、その画像に対して再度書き込み処理を行わないことにより、前記識別情報が付加された画像を改変不可とすることを特徴とする。

【0010】また、好ましくは、前記制御手段は、例えば請求項5記載のように、前記画像を前記識別情報と共に暗号化する暗号化手段と、暗号化されたデータを解読する解読手段とを備えていてもよい。

【0011】また、好ましくは、前記制御手段は、例えば請求項6記載のように、前記画像に所定の情報を埋め込む埋め込み手段と、前記所定の情報が埋め込まれている画像から前記所定の情報を分離する分離手段とを備えていてもよい。

【0012】また、好ましくは、前記制御手段は、例えば請求項7記載のように、前記再生手段により前記撮像手段から撮像された画像を再生している際に、改変不可

使用し、一旦格納した画像データをそのまま保持し、消去したり上書きしたりできないような使用の場合、消去不可メモリ8bを装着して使用するようにする。

【0023】また、9はキー入力部であり、当該電子スチルカメラの動作モード(シャッターキー9a、再生キー、画像送りキー)や、各種設定値を設定するスイッチ等から構成される。キー入力部9の状態は、CPU(中央処理装置)10に取り込まれるようになっている。

【0024】CPU10は、ROM11内のプログラム、およびキー入力部9のスイッチの状態に従って各部の動作を制御する。特に、CPU10は、上述したDRAM6に一旦格納した画像データを、フラッシュメモリ8aまたは消去不可メモリ8bに格納する。

【0025】ROM11は、半導体メモリ以外にも、磁気的、光学的記録媒体で構成された記憶媒体であってもよく、上記CPU10によって実行されるプログラムおよびデータを記憶している。該記憶媒体(ROM11)は、固定的に設けられたもの、もしくは着脱自在に装着されたものである。また、記憶媒体(ROM11)に記録されるプログラム、データ等は、通信回路等を介して接続された他の機器から受信して記憶する構成にしてもよく、さらに、通信回路等を介して接続された他の機器側に上記記憶媒体(ROM11)を設け、該記憶媒体(ROM11)に記憶されているプログラム、データ等を通信回路を介して使用する構成にしてもよい。

【0026】次に、12はRAM(ランダムアクセスメモリ)であり、上記CPU10のワーキングエリアとして用いられる。また、13は、リアルタイムに変換された映像信号を入力するインターフェースとして機能するI/Oポートであり、特に、本第1の実施の態様では、他の機器(例えば、電子スチルカメラ、コンピュータ等)との間で、記録した画像データを授受する際に用いられる。次に、15はSG(Signal Generator:ビデオ信号発生器)であり、圧縮/伸張部7により伸張された順度信号に色信号を重畳し、同期信号等を附加して、デジタルビデオ信号を作成し、LCD16へ出力する。LCD(液晶表示器)19はパワファ18を介して供給されるデジタルビデオ信号に従って、映像を表示する。

【0027】A-2. 第1の実施の態様の動作

次に、上述した第1の実施の態様による電子スチルカメラの動作について説明する。なお、以下の説明では、上述した消去不可メモリ8bをソフトウェアにより消去(上書き)不可とした例について説明する。

(a) メモリ検出処理

図2は、上述した電子スチルカメラのメモリ検出処理の動作を説明するためのフローチャートであり、該フローチャートで示されるプログラムはROM11に格納されている。また、図3および図4は、メモリ検出処理を説明するための概念図である。まず、ステップS10において、コネクタ20を介して装着されたメモリ(フラッ

ッシュメモリ)あるいは消去不可メモリ)にアクセスし、その応答に従って、フラッシュメモリ8aが装着されているかを否かを判断する。ここで、図3(a)に示すように、コネクタにフラッシュメモリ8aが装着されている場合は、ステップS12に進み、図3(b)に示すように、装着されているメモリの種類を示すフラグF1を「0」とする。

【0028】一方、フラッシュメモリ8aが装着されていない場合は、ステップS14に進み、消去不可メモリ8bが装着されているかを否かを判断する。そして、図4(a)に示すように、コネクタに消去不可メモリ8bが装着されている場合は、ステップS16に進み、図4(b)に示すように、上記フラグF1を「1」とする。また、いずれのメモリも装着されていない場合は、ステップS18に進み、画像データの保存用のメモリが装着されていない旨をLCD16に表示する。

【0029】(b) 画像記録処理

次に、図5は、本第1の実施の態様による電子スチルカメラの画像記録処理を説明するためのフローチャートであり、該フローチャートで示されるプログラムはROM11に格納されている。まず、ステップS20で、CCD1によって撮影された映像を取り込む。次に、ステップS22で、SG15より、取り込んだ画像データに同期信号等を附加して、デジタルビデオ信号を作成し、D/A変換器17でアナログ信号に変換した後、LCD16で表示する。そして、ステップS24で、キー入力部9のシャッターキー9aが押下されたかを否かを判断し、押下されていない場合は、ステップS20に戻る。したがって、LCD9には、所定のサンプリングタイミング(リアルタイム)で、CCD1により撮影された映像が表示されることになる。

【0030】一方、上記過程において、シャッターキー9aが押下されると、ステップS26に進み、装着されているメモリのタイプを示すフラグF1が「0」であるかを否かを判断する。そして、フラッシュメモリ8aが装着されている場合は、ステップS30に進み、シャッターキー9aが押下された時点で、TG4が出力する画像データを一旦DRAM6に格納した後、圧縮/伸張部7により圧縮し、現在の書き込みアドレスに従って、装着されているメモリ、この場合、フラッシュメモリ8aに格納する。次に、ステップS32で、書き込みアドレスを更新し、ステップS20に戻る。

【0031】一方、フラグF1が「1」の場合、すなわち消去不可メモリ8bが装着されている場合には、ステップS28に進み、現在の書き込みアドレスで示されるメモリ領域が空きエリアであるかを判断する。そして、該メモリ領域が空きエリアでない場合は、また画像データが記録されていないエリアであれば、上述したステップS30に進み、シャッターキー9aが押下された時

点で、TG4が出力する画像データを一旦DRAM6に格納した後、圧縮/伸張部7により圧縮し、現在の書き込みアドレスに従って、装着されているメモリ、この場合、消去不可メモリ8bに格納する。次に、ステップS32で、書き込みアドレスを更新し、ステップS20に戻る。

【0032】また、装着されているメモリが消去不可メモリ8bで、現在の書き込みアドレスで示されるメモリ領域が空きエリアではなく、既に画像データが記録されている旨の場合は、ステップS34で、書き込み不可であるという旨のメッセージをLCD16に表示し、画像データを記録することなく、ステップS20に戻る。

【0033】以下、ステップS20～S34を繰り返して実行することにより、CCD1により撮影した映像を、そのとき装着したメモリに画像データとして記録する。このとき、装着されているメモリがフラッシュメモリ8aの場合には、書き込みアドレスによって示されるメモリ領域に既に画像データが記録されているかを否かに向う方、そのメモリ領域に新たな画像データを記録する一方、装着されているメモリが消去不可メモリ8bの場合には、既に画像データが記録されているメモリ領域に新たな画像データを記録しようとしても書き込み不可として拒否する。

【0034】このように、上述した第1の実施の態様では、消去不可メモリ8bが装着されている場合には、既に記録された画像データの消去が禁止されるので、複製した画像データを必要とすることなく、記録した画像データを消去不可にする。また、消去不可メモリ8bがハードウェアにより消去不可となっている場合には、既に画像データが格納されたアドレスに新たに画像データを格納しようとする、アクセスそのものが拒否されるので、特別な処理を行うことなく、記録した画像データを消去不可にする。なお、消去不可メモリ8bに空き容量がなくなれば、消去不可メモリ8bを新たなものとすればよい。

【0035】B. 第2の実施の態様

次に、本発明の第2の実施の態様について説明する。B-1. 第2の実施の態様の構成

図6は、第2の実施の態様による電子スチルカメラの構成を示すブロック図である。なお、図1に対応する部分には同一の符号を付けて説明を省略する。図において、本第2の実施の態様では、書き換え可能なフラッシュメモリ8aを常設するとともに、消去不可メモリ8bを着脱自在に装着することができるようになっている。選択回路21は、CPU10からの指示により、フラッシュメモリ8aまたは消去不可メモリ8bのいずれか一方を選択し、メモリのデータのバスおよびアドレスバスをCPU10のデータバスおよびアドレスバスに接続する。CPU10は、該選択回路21により選択したメモリに対して、画像データを格納するようにしている。ま

た、CPU10は、選択回路21を介して消去不可メモリ8bが装着されているかを否かを検出できるようにしている。

【0036】B-2. 第2の実施の態様の動作

次に、上述した第2の実施の態様の動作について説明する。

(a) 消去不可メモリ検出処理

図7は、上述した第2の実施の態様による電子スチルカメラにおいて、消去不可メモリが装着されているかを否かを検出する処理動作を説明するためのフローチャートであり、該フローチャートで示されるプログラムはROM11に格納されている。まず、ステップS40において、選択回路21を介して消去不可メモリ8bの装着を検出し、ステップS42で、検出結果に基づいて消去不可メモリ8bが装着されているかを否かを判断する。そして、消去不可メモリ8bが装着されていない場合には、ステップS44で、図8に示すように、装着/未装着を示すフラグF3を「0(未装着)」とし、消去不可メモリ8bが装着されている場合には、ステップS46で、図8に示すように、上記フラグF3を「1(装着)」とする。なお、フラッシュメモリ8aは、常設であるので、該メモリに対するフラグF2は「1」となる。

【0037】(b) 選択処理

次に、図9は、第2の実施の態様による電子スチルカメラにおいて、フラッシュメモリ8aまたは消去不可メモリ8bのどちらかを用いるかをユーザに選択させる選択処理の動作を説明するためのフローチャートであり、該フローチャートで示されるプログラムはROM11に格納されている。まず、ステップS50で、キー入力部9のメモリ選択キーが操作されたかを否かを判断し、メモリ選択キーが操作されていない場合は、他の処理あるいは操作されたキーに対応する処理に進み、メモリ選択キーが操作されれば、ステップS52に進む。

【0038】ユーザは、撮影した映像を書き換え可能とする場合には、フラッシュメモリ8aを選択し、撮影した映像を書き換え不可能とする場合には、消去不可メモリ8bを選択する。ステップS52では、フラッシュメモリ8aが選択されたかを否かを判断し、フラッシュメモリ8aが選択された場合には、ステップS54で、図10に示すように、選択されたメモリを示すフラグF4を「0(フラッシュメモリ)」とする。

【0039】一方、消去不可メモリ8bが選択された場合には、ステップS56に進み、フラグF3を参照することにより、消去不可メモリ8bが装着されているかを判断する。そして、消去不可メモリ8bが装着されている場合は、すなわちフラグF3が「1」ならば、ステップS58に進み、図10に示すように、選択されたメモリを示すフラグF4を「1(消去不可メモリ)」とする。

【0040】また、消去不可メモリ8bが装着されてい



る。  
【0056】なお、上述した実施の態様では、画像送信  
処理において、双方の電子スチルカメラ間で赤外線によ  
り通信し、画像データを送信したが、これに限らず、有  
線、無線、またはモデムによって通信回線を介して送信  
するようにしてもよい。  
【0057】D. 第4の実施の態様  
次に、本発明の第4の実施の態様について説明する。  
D-1. 第4の実施の態様の構成  
図17は、本発明の第4の実施の態様による電子カメラ  
システムを示すブロック図である。図において、電子カ  
メラ21は、図12に説明したものとほぼ同様の構成と  
なっている。電子カメラ21は、所定の通信プロトコル  
を有しており、通信回線22に直接接続してもよいし、  
パーソナルコンピュータ(PC)23を介して接続して  
もよい。また、電子カメラ21、21同士を赤外線通信  
24等で接続してもよい。また、通信回線22にプロバ  
イダ25が接続することにより、画像の伝送に関する様  
々なサービスを行うことができる。  
【0058】D-2. 第4の実施の態様の動作  
次に、上述した第4の実施の態様の動作について説明す  
る。図18、図19は、第4の実施の態様の動作を説明  
するフローチャートである。本第4の実施の態様による  
電子カメラ21には、撮影モード、再生モード、編集モ  
ードが用意されている。まず、ステップS201により  
モード判別がなされる。撮影モードと判別されたとき、  
ステップS202へ進む。  
【0059】(a) 撮影モード  
本第4の実施の態様では、シャッターキー9aが2段階  
構成となっており、プリシャッター(シャッターキー9  
aの半押し)で、例えばオートフォーカス等の所定の処  
理を行い、本シャッター押しで、画像の記録を行う。プ  
リシャッターが押されるまでは、ステップS202、S  
203のループにより、CCD1から撮影した画像を、  
所定の画像処理を行った後、DRAM6に取り込み、し  
てCD16にビューファインダとしてモニタ表示を行っ  
ている。ステップS202でプリシャッター押しが検出さ  
れると、ステップS204へ進む。  
【0060】ステップS204では、改変不可モードで  
あるか否かを判断する。本第4の実施の態様では、撮影  
画像を改変不可として撮影するモードと、編集可能とし  
て撮影するモードとを切り替え選択することができ、  
改変不可モードに設定されている時は、ステップS20  
5へ進む。警告表示を行う。この警告は、改変不可モー  
ドで撮影した画像は、編集、書き換えができないので、  
その状態で撮影OKかどうかの判断を促す警告メッセー  
ジである。改変不可モードで撮影した画像の消去を禁止  
するが、消去を可能とするかは適宜設計できる。  
【0061】次に、ステップS206では、例えばオー  
トフォーカスとか、本シャッター押し前に処理しておく

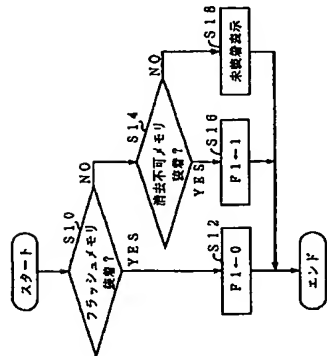
としては、例えば、米国特許出願US5,530,859、US95,6  
36,292、US95,568,570や、国際特許出願WO96-36163、WO  
96-27259、WO95-14289等がある。本発明では既存の電子  
鑑識手法を採用することができ、説明は省略す  
る。  
【0066】(b) 再生モード  
次に、再生の動作について図24を参照して説明する。  
キー入力部9の操作により再生モードに設定すると、ス  
テップS231により、何らかの方法で画像を指定す  
る。この指定は、最後に撮影した画像としてもいいし、  
番号等により指定してもよい。そして、ステップS23  
2で、指定された画像が暗号化されているか否かを判断  
し、暗号化されていないならば、ステップS234で、そ  
のまま再生表示処理を行う。一方、暗号化されていれ  
ば、ステップS233で、解読してから表示する。電子  
透かしが埋め込まれている場合には、ステップS233  
内で分離を行う。この分離処理は、テキスト情報が埋め  
込まれた画像はそのままにして、テキスト情報を再生す  
る方法でよいし、テキスト情報を完全に取り除く方法  
でもよい。  
【0067】そして、ステップS234で解読された画  
像の表示処理を行う。改変不可とされている画像は、必  
ず暗号化されているから、解読機能を有していない画像  
処理装置などで再生されることはない。そして、このス  
テップS234の表示処理では、内蔵LCD16への出力  
力のみかできないように設計されており、ビデオ出力  
は、アナログ出力、デジタル出力共にできないようにな  
っている。もし、ビデオ出力してしまうと、別の画像処  
理装置等で受信され、改変されてしまう可能性があるか  
らである。  
【0068】(c) 送信モード  
ここで、電子カメラ21の通信手段による画像送信の動  
作について図25を参照して説明する。ステップS24  
0、S241、S242は、図24に示すステップS2  
31、S232、S233と同様であるので説明を省略  
する。指定された画像が改変可能であれば、ステップS2  
43で、そのまま送信する。一方、指定された画像が改  
変不可であれば、ステップS244で、送信不可である  
ことを示すメッセージを表示する。  
【0069】このように、本第4の実施の態様の電子カ  
メラ21の通信手段による画像送信の場合は、改変不可  
に設定されている画像は送信しないように設計されてい  
る。フラッシュメモリ8aに記憶されているすべての画  
像を一括送信する場合も、改変不可に設定されていない  
画像だけを選択的に送信する。したがって、別の画像処  
理装置等で受信され、見られたり、改変されたりするこ  
とを防止できる。  
【0070】(d) 編集モード  
次に、編集の動作について図28を参照して説明する。  
ステップS251、S252、S253は図24に示す

ステップS231、S232、S233と同様であるの  
で説明を省略する。再生との相違点は、再生では画像を  
見るだけであるのに対し、編集では画像を改変して再写  
き込みすることができ、点である。すなわち、ステッ  
プS254で、指定された画像が改変不可に設定されてい  
るか否かを判断する。改変可能であれば、ステップS25  
5で、図24のステップS234と同様に再生表示処理  
を行う。そして、ステップS256で、編集処理を行っ  
た後、ステップS257で、編集後の画像をフラッシュ  
メモリ8aに書き込む。したがって、画像は改変される  
ことになる。編集処理自体は公知であるので説明は省略  
する。一方、ステップS254で改変不可と判定され  
ると、ステップS258で、編集不可であるメッセー  
ジ表示してステップへ戻る。したがって、画像は改変され  
ない。  
【0071】  
【発明の効果】請求項1記載の発明によれば、記憶制御  
手段によって、前記撮影手段により撮影した画像を、前  
記第1の記憶手段または前記第2の記憶手段のいずれか  
一方に画像データとして記憶するようにしたので、第2  
の記憶手段には、撮影したそのままの映像が画像データ  
として記憶できるといふ利点が得られる。  
【0072】また、請求項2記載の発明によれば、前記  
第1の記憶手段および第2の記憶手段を連続可能とし、  
一度にどちらか一方が装填されるようにしたので、第2  
の記憶手段には、撮影したそのままの映像が画像データ  
として記憶できるとともに、撮影した画像データを書き  
換え可能に記憶しない場合には、第1の記憶手段を装替  
し、撮影した画像データを書き換え不可能に記憶したい場  
合には、第2の記憶手段を装替すること、目的に応じ  
てどちらの方法でも撮影できるといふ利点が得られる。  
【0073】また、請求項3記載の発明によれば、選択  
手段によって、前記第1の記憶手段または前記第2の記  
憶手段のどちらに画像データを記憶するかを選択し、前  
記記憶制御手段は、前記撮影手段により撮影した映像を  
前記選択手段により選択された記憶手段に画像データと  
して記憶するようにしたので、第2の記憶手段には、撮  
影したそのままの映像が画像データとして記憶できると  
ともに、撮影した画像データを書き換え可能に記憶した  
場合には、第1の記憶手段を選択し、撮影した画像デ  
ータを書き換え不可能に記憶したい場合には、第2の記憶  
手段を選択するだけで、目的に応じてどちらの方法でも  
撮影できるといふ利点が得られる。  
【0074】また、請求項4記載の発明によれば、指示  
手段の操作に応じて記憶された映像画像に改変不可である  
ことを示す識別情報を付加して記憶するので、撮影した  
画像を後で改変されることを防止することができるとい  
ふ利点が得られる。また、請求項5記載の発明によれ  
ば、改変不可に設定された映像は識別情報と共に暗号化  
されて記憶されるので、解読手段がなければ解読できな

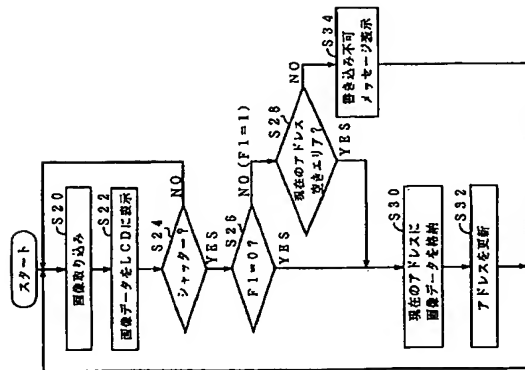




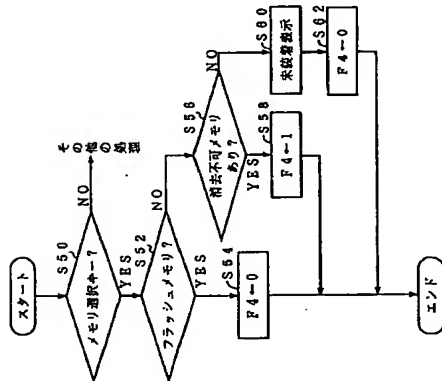
【図2】



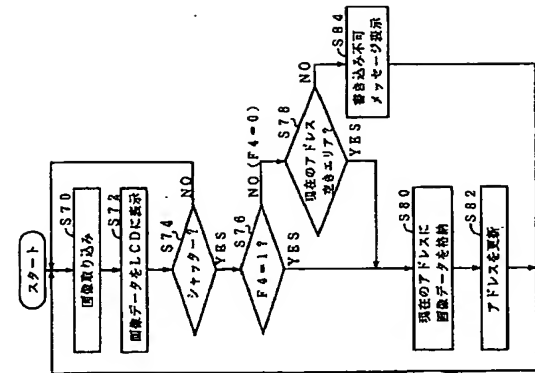
【図5】



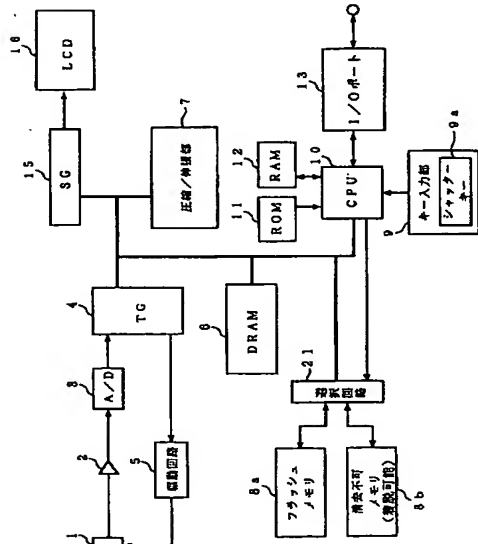
【図9】



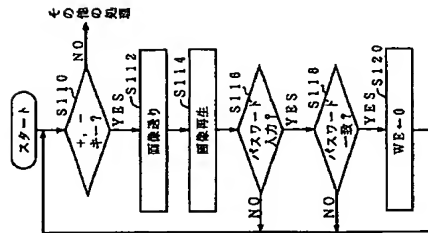
【図11】



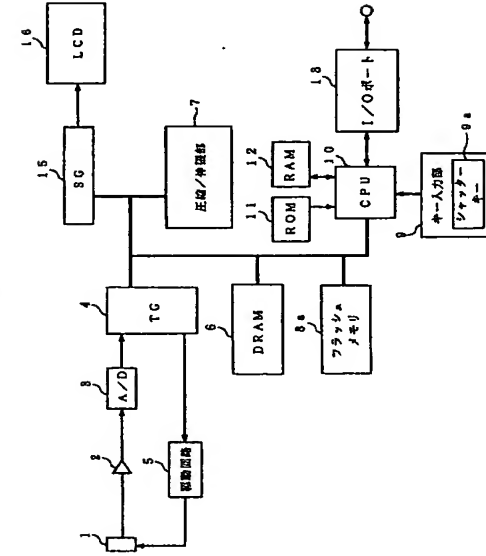
【図6】



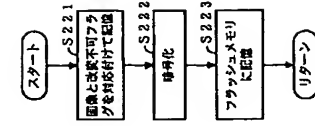
【図16】



【図12】



【図20】



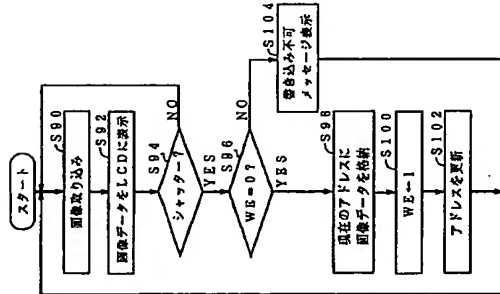


【図13】

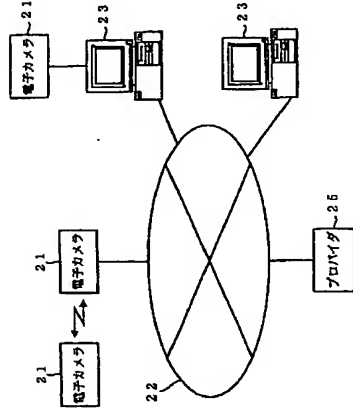
1枚目の画像データ	画像データアドレス
2枚目の画像データ	消去可/不可情報
3枚目の画像データ	画像データアドレス
	消去可/不可情報
	画像データアドレス
	消去可/不可情報
	画像データアドレス
	消去可/不可情報
n枚目の画像データ	画像データアドレス
	消去可/不可情報

消去可/不可情報: WE  
0: 消去可  
1: 消去不可

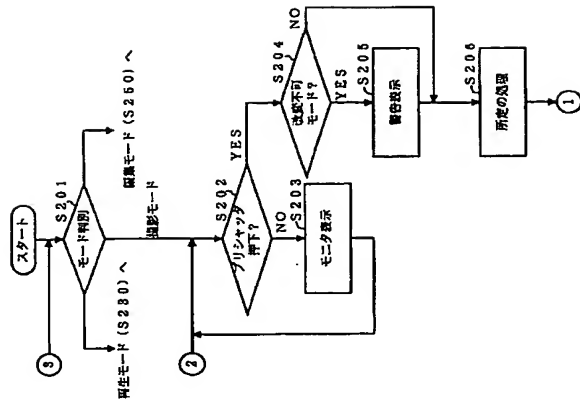
【図14】



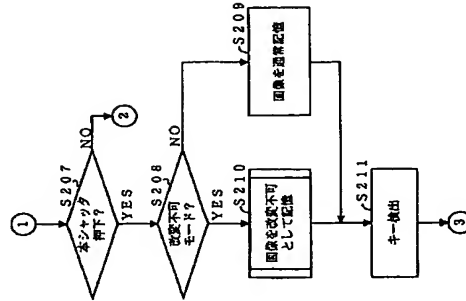
【図17】



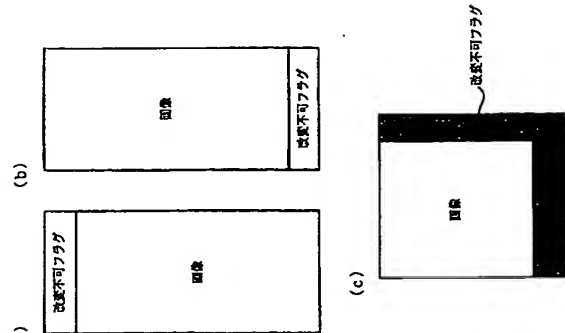
【図18】



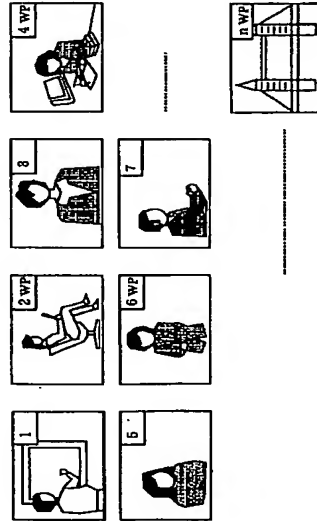
【図19】



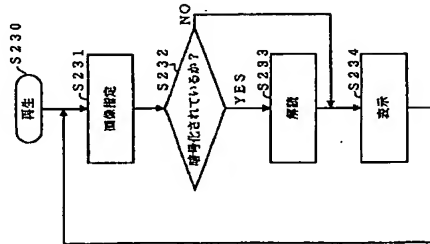
【図21】



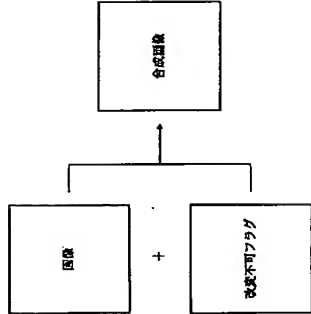
【図15】



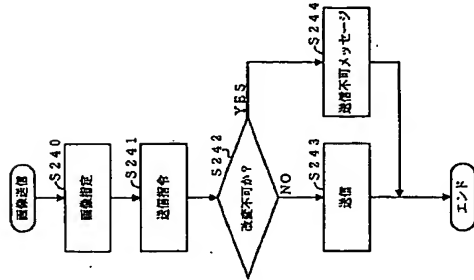
【図24】



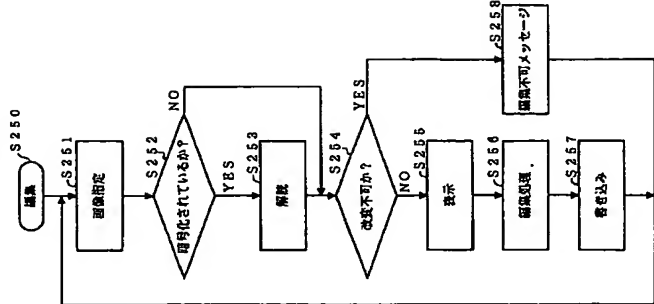
【図22】



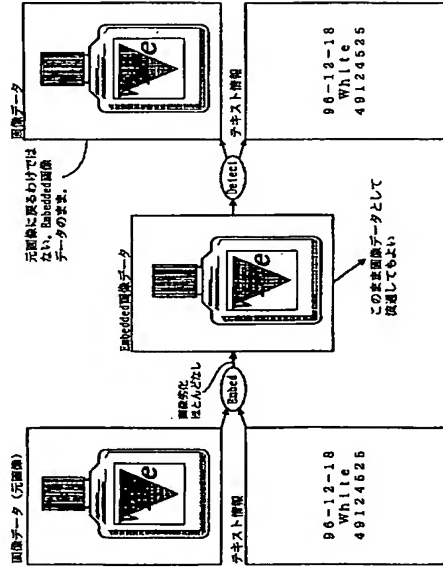
【図25】



【図26】



【図23】



【公報種別】特許法第17条の2の規定による補正の掲載

【部門区分】第7部門第3区分

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G 0 6 F 15/64 4 5 0 A

【手続補正書】

【提出日】平成16年12月24日(2004.12.24)

【手続補正1】

【補正対象書類名】明細書

【補正対象項目名】特許請求の範囲

【補正方法】変更

【補正の内容】

【特許請求の範囲】

【請求項1】

映像を撮影する撮影手段と、  
画像データを書き換え可能に記憶する第1の記憶手段と、  
画像データを書き換え不可能に記憶する第2の記憶手段と、  
前記撮影手段により撮影した映像を画像データとして、前記第1の記憶手段または前記第2の記憶手段のいずれか一方に記憶する記憶制御手段とを具備することを特徴とする電子撮像装置。

【請求項2】

前記第1および第2の記憶手段は、着脱可能であり、一度にどちらか一方が装着されることを特徴とする請求項1記載の電子撮像装置。

【請求項3】

前記第1の記憶手段または前記第2の記憶手段のどちらに画像データを記憶するかを選択する選択手段を具備し、  
前記記憶制御手段は、前記選択手段により選択された記憶手段に、前記撮影手段により撮影した映像を画像データとして記憶することを特徴とする請求項1記載の電子撮像装置。

【手続補正2】

【補正対象書類名】明細書

【補正対象項目名】0010

【補正方法】削除

【補正の内容】

【手続補正3】

【補正対象書類名】明細書  
【補正対象項目名】0011  
【補正方法】削除  
【補正の内容】

【手続補正4】  
【補正対象書類名】明細書  
【補正対象項目名】0012  
【補正方法】削除  
【補正の内容】

【手続補正5】  
【補正対象書類名】明細書  
【補正対象項目名】0013  
【補正方法】削除  
【補正の内容】

【手続補正6】  
【補正対象書類名】明細書  
【補正対象項目名】0014  
【補正方法】削除  
【補正の内容】

【手続補正7】  
【補正対象書類名】明細書  
【補正対象項目名】0015  
【補正方法】削除  
【補正の内容】

【手続補正8】  
【補正対象書類名】明細書  
【補正対象項目名】0016  
【補正方法】削除  
【補正の内容】

【手続補正9】  
【補正対象書類名】明細書  
【補正対象項目名】0017  
【補正方法】削除  
【補正の内容】

【手続補正10】  
【補正対象書類名】明細書  
【補正対象項目名】0018  
【補正方法】削除  
【補正の内容】

【手続補正11】  
【補正対象書類名】明細書  
【補正対象項目名】0019

【補正方法】 削除  
【補正の内容】

【手続補正 1 1 2】  
【補正対象書類名】 明細書  
【補正対象項目名】 0 0 2 0  
【補正方法】 削除  
【補正の内容】

【手続補正 1 1 3】  
【補正対象書類名】 明細書  
【補正対象項目名】 0 0 7 4  
【補正方法】 削除  
【補正の内容】

【手続補正 1 1 4】  
【補正対象書類名】 明細書  
【補正対象項目名】 0 0 7 5  
【補正方法】 削除  
【補正の内容】

【手続補正 1 1 5】  
【補正対象書類名】 明細書  
【補正対象項目名】 0 0 7 6  
【補正方法】 削除  
【補正の内容】

【手続補正 1 1 6】  
【補正対象書類名】 明細書  
【補正対象項目名】 0 0 7 7  
【補正方法】 削除  
【補正の内容】